

AMERICAN ARTISAN

NOVEMBER 1953

Warm Air Heating
Residential Air Conditioning
Sheet Metal Contracting

FEATURES THIS MONTH

• MODERNIZATION of gravity heating system for New Orleans home provides year 'round comfort page 66

• TEN STEPS in sizing cooling equipment — a check list for residential air conditioning estimates page 56

• ADVERTISING with truck signs — an effective, economical way to reach prospective customers page 69

• COVER PICTURE — 1800 curtain wall panels for a 26 story office building were hoisted into place in 6½ days page 72

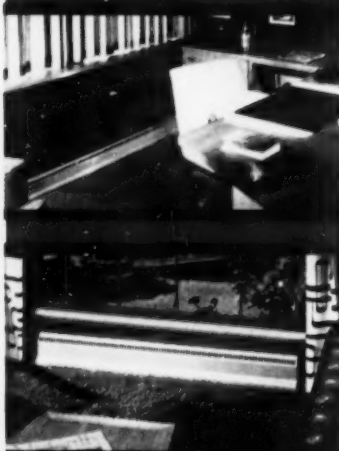
Complete Contents p. 4



THE NEW

Air Control

**No. 180 SERIES BASEBOARD
PERIMETER DIFFUSER**



TWO SIZES

4 feet (standard size)

2 feet (for small rooms)

**the one baseboard perimeter
diffuser that gives you the finest styling
superior performance and
low, low cost.**

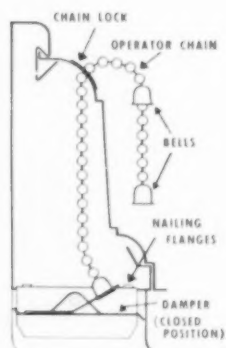
IT'S FLEXIBLE! Use as single unit or in multiples. Handy connector strips make continuous baseboards along outside walls practical.

IT'S FAST! Install it in minutes on old or new jobs. Just place rear section against wall, make stack-head connection . . . then front locks on.

IT'S HANDSOME! The photos prove that this diffuser will get immediate acceptance in commercial or residential applications . . . it's styled to blend with any room.

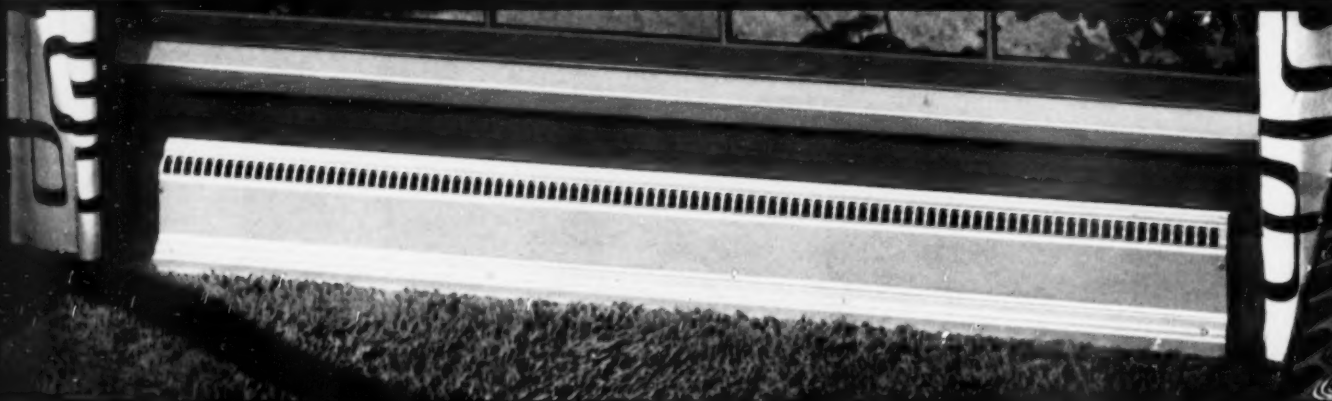
IT COSTS FAR LESS. Glance at the price list and you'll know that this diffuser will save money on every job.

SEPARATE SELF-CONTAINED DAMPER



Damper fits into duct after back section is installed. Operator chain is fed through lock plate on front section. Extra chain bell is furnished . . . clip it on chain to balance system from diffuser face.

WRITE FOR BULLETIN No. 104 AC OR SEE YOUR JOBBER.



AIR CONTROL PRODUCTS, INC.

DEPT. A

COOPERSVILLE, MICH.

**ANOTHER HEATING
INSTALLATION SOLD TODAY!**



**YES, MORE SALES ARE MADE
FROM A COMPLETE LINE!**

CENTURY'S Complete Gas & Oil Line

helps close more sales . . . make more sales!

Fit the unit to the job without compromise or hesitation. Select and recommend from 40 models of gas or oil fired Century units. You can be sure of your judgment and your own confidence will convince your prospect. Resistance is always more

easily overcome when your sales points are backed up by Century's Complete Line.

Write or call Century's Heating Sales Division today. You'll learn more about the complete heating line that *closes* more sales and *makes* more sales.

Lined up for more sales, just a part of Century's Complete New Line

NEW CENTURY HIBOYS

Restyled and redesigned for efficient service-free heat at a competitive price. Bottom, side or rear air intake. (4 models gas and 4 models oil.)



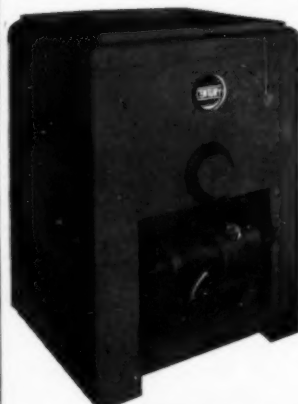
NEW CENTURY COUNTER-FLOWS—Permits installation flush at sides and rear, giving zero clearance! May be installed even on combustible floors! Approved by A.G.A. and Underwriter's Laboratories Inc. Another Century first. (4 models gas and 4 models oil.)



**APPROVED
FOR ZERO
CLEARANCE**

NEW CENTURY GRAVITY UNITS

Low cost heating, compact and easy to install. A realistic solution for small and medium sized homes. (3 models gas and 3 models oil.)



NEW CENTURY LOBOYS

Newly engineered to incorporate (optional) the exclusive Century Air Washer for automatic "living room control" of the exact degree of humidity desired. (6 models gas and 8 models oil.)

To round out the line: — Boiler-Burner Units (oil, 3 models) and gas and oil Conversion Burners. Also Industrial type Hiboy units.

Century

CENTURY ENGINEERING CORPORATION, Cedar Rapids, Iowa

...manufacturers of fine automatic heating equipment for 27 years

Nationally advertised in leading home magazines.

AMERICAN ARTISAN

NOVEMBER 1953

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Founded 1864

Volume 90 No. 11

WARM AIR HEATING

RESIDENTIAL AIR CONDITIONING

SHEET METAL CONTRACTING

Merged with American Artisan are "Warm Air Heating" and "Furnaces and Sheet Metals"

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Syncromatic

HI-CAP

WARM AIR FURNACES FOR

OIL-GAS-COAL

Installed from
Coast

to

Coast



... **H**I-CAPS ARE INSTALLED IN ALL TYPES OF PUBLIC AND COMMERCIAL BUILDINGS WHERE GOOD HEATING, SAFETY AND ECONOMY ARE REQUIRED.

... **F**LEXIBILITY: HI-CAPS ARE AVAILABLE FOR USE WITH ALL FUELS AND ARE EQUALLY ADAPTABLE FOR CONVENTIONAL, COUNTERFLOW OR PERIMETER INSTALLATIONS.

... **T**HE LOW FIRST COST, ECONOMICAL OPERATION AND LOW UPKEEP COST MAKE THE HI-CAP ONE OF THE MOST WIDELY ACCEPTED LARGE FURNACES IN THE INDUSTRY.

RATINGS FROM 330,000 TO 1,000,000 B.T.U. OUTPUT.

FOR COMPLETE SPECIFICATIONS AND INFORMATION WRITE OR CALL:.....

HI-CAP SAYS

"WE WELD
'EM INSIDE
& OUTSIDE
FOR DOUBLE
PROTECTION"



Syncromatic Corporation
WATERTOWN, WISCONSIN

the editor's notebook

How Environment Affects Body Heat Loss

INACTIVE men are equally comfortable at either 30 or 80 per cent relative humidity in temperatures ranging from 72 to 76 F. Their skin temperatures are higher at 80 per cent relative humidity than at 30 per cent. Compared with women in similar environments, men have higher skin temperatures and greater heat losses by evaporation. These are some of the observations of a research study sponsored by the American Society of Heating and Ventilating Engineers and the United States Public Health Service in co-operation with the University of Illinois College of Medicine, results of which were recently reported at the ASHVE's semi-annual meeting in Denver. The authors stated that the object of their research was to re-examine the effects of environments with widely different relative humidities on the partition of heat loss of uniformly and lightly clad men and on their subjective sensations of thermal comfort.

Award Contracts for Chicago Building

VENTILATION work in the completely air conditioned Prudential Insurance Co. of America building now under construction in Chicago will be done by R. B. Hayward Co. and Jamar-Olmen Co. as a "joint venture," according to a recent announcement.

The Prudential building is the first big downtown office building for Chicago to be built since the early 1930's.

Building Permits Show Cooling Sales Potential

A KEY indicator of the sales potential for air conditioning equipment is the volume of

HERE THEY ARE...SENTRY'S TWO NEWEST ADDITIONS TO THEIR EVER-POPULAR

AT-A-GLANCE

(DIRECT AND REMOTE)

TANK GAUGES

THERMA-GAUGE

A superior quality, precision instrument with full view, solid red thermometer-type indicator

Without question, here is the easiest to read, accurate measure gauge on the market—And, the easiest to install, whether tank is empty, full or partially full. Unit features zinc base metal, two-piece die-cast assembly — Unbreakable red plastic assembly nut — Calibration chart, sealed between heavy, heat-resistant plastic domes — Brass rivets — And, a double coated cork float that's impervious to oil, many chemicals and acids. No gears, magnets, cams or tapes. Guaranteed to withstand in excess of 70 lbs. pressure per sq. inch. Tailor-made to fit individual tanks up to 12 ft. deep. Calibrated and factory adjusted.

QUICKLY, SIMPLY INSTALLED. Illus. at left shows how entire calibration and float assembly may be inserted and positioned after two piece die-cast tank plug has easily been installed in tank — only an ordinary wrench is needed.



SENTR-ECON

A new, durable, low cost instrument for economy installations.

Exceptionally high quality for such a competitively priced gauge. Features patented double dome with calibrations positioned between inner tube and outer heat-resistant plastic shell. Also, die-cast tank fitting — plated metals — brass rivets. No gears, magnets, cams or intricate mechanisms. Double coated cork float is impervious to oils, most chemicals and acids. Simple to install, even in partially-filled tanks. 1½" openings only. Factory calibrated and adjusted to insure accuracy.



KRUEGER SENTRY GAUGES
GREEN BAY • WISCONSIN



Write for complete details — literature

the editor's notebook

(continued)

building permits—which continues high. Dun & Bradstreet reports that permit valuations from 251 U. S. cities, for residential and non-residential construction, were up 18 per cent in the first eight months of this year as compared to the same period in 1952. The relation between the favorable trend in building permits and opportunities in the air conditioning field is a close one. Permits for remodeling as well as new construction are included in the eight month total of \$3.5 billion, and there is an increasing percentage of new building and remodeling calling for year 'round air conditioning.

Movie Documents Sheet Metal Research

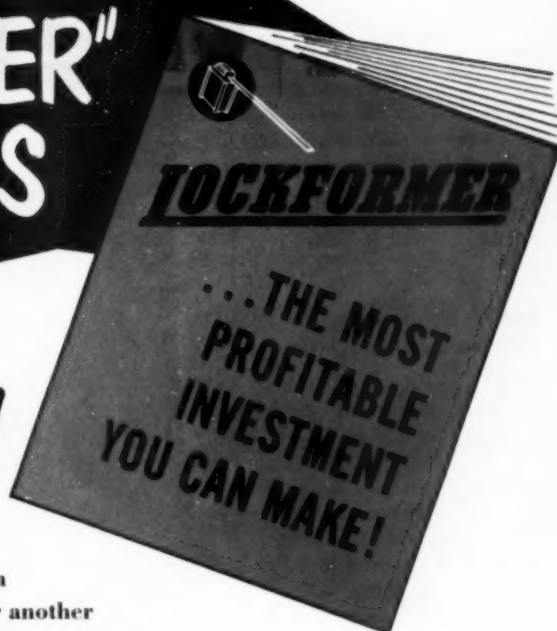
THE PRINCIPLES of sheet metal construction are presented in a 46 minute, 16 mm color motion picture entitled Sheet Metal in Building Construction, recently released by Revere Copper & Brass, Inc. Interested groups may address requests for showings to the company's home office at 230 Park Ave., New York 17.

Steel-Making Capacity Growing

MORE STEEL is made now in a week at 95 per cent of the national steel making capacity (as rated at the start of this year) than when the rate was 100 per cent of capacity as rated at the start of 1952, according to American Iron and Steel Institute. While the weekly figure — showing the per cent of capacity operated or scheduled to be operated — is widely watched as an economic barometer, the institute explained that the figures showing the tons of steel made or scheduled to be made are most important.

A "BEST SELLER" FOR 17 YEARS

and still on TOP!



No sheet metal man has to be "sold" a Lockformer. When he opens a new or another shop, he orders a new Lockformer—the same way he orders another telephone, a pair of snips or a new motor truck. For a Lockformer is part and parcel of the sheet metal business.



Each passing year only serves to confirm Lockformer's unique position as a "must" in sheet metal fabrication. Sheet metal men, themselves, "sell" more Lockformers than all our Distributors put together. Their sales talk is brief and to the point: "If you make ducts, you need a Lockformer." The reasons, to them, are too self-evident to need explanation.



Send for your copy
of the new
Lockformer Catalog
today.



ONE MAN WITH A LOCKFORMER MAKES MORE PITTSBURGH LOCKS THAN SIXTEEN MEN WITH EIGHT BRAKES

THE LOCKFORMER CO.

4615 WEST ROOSEVELT ROAD • CHICAGO 30, ILLINOIS

the editor's notebook

(continued)

"Now, at only 88 per cent of capacity, more steel can be made than in the most active week of 1950 when the steel making furnaces were being operated at 100 per cent of that year's weekly capacity," the institute reports.

Public Relations Studied By Dealers

THE CHAMBER of Commerce of the United States is sponsoring a series of one-day conferences in different parts of the country designed to show businessmen how they can explain some of the problems of business to their employees in terms of the employees' own interest. For example, conferences cover why inventions or new ideas in merchandising create rather than eliminate jobs and how employees, management and owners have a common stake in the success of a business. Speakers explain how the employer or manager can get his ideas across to the people who work for him, and they show that when he does, employee morale goes up, and with it, efficiency and productivity. Good community relations are also stressed. At one recent conference, businessmen were given dozens of examples of how their firms can be good neighbors. They were told how one company campaigned to get employees and the public to vote, how another boosted a Community Chest campaign without seeking any publicity for itself, how another put on a "post prom" party for high school youngsters, etc.

U. S. Personal Income Well Above Last Year's

PERSONAL income in August was at an annual rate of \$287 billion, according to the Office of Business Economics,



ALL OIL BURNERS
Look alike
but they're
NOT
Nu-Way
GIVES YOU ALL THESE
POINTS OF DIFFERENCE

① **BRASS BUS BARS**—Assures positive, safe ignition. No springs or wires.

② **TRANSFORMERS**—More turns of wire and more coil laminations give a longer life even under low voltage conditions. Aluminum foil shield eliminates radio and television static.

③ **PATENTED NOZZLE SHIELD**—Eliminates carbon deposits which reduce efficiency as much as 20% in one season!

④ **COMPLETE LINE**—Nu-Way builds a complete line of oil burners for domestic, commercial installations.

★ **EXCEEDS UNDERWRITERS' REQUIREMENTS**

★ **32 YEARS EXCLUSIVE MANUFACTURE**

Remember with
Nu-Way

THERE'S A PROFITABLE DIFFERENCE in Nu-Way! Write today for full details on the Nu-Way line.

THE NU-WAY CORPORATION
Dept. AA
ROCK ISLAND, ILLINOIS

Sold through Jobbers and Distributors.
Also Special Applications for Furnace
and Boiler Manufacturers.



LOOK FOR THE FLAME

"Automatic Oil Heat Exclusively Since 1923"

the editor's notebook

(continued)

U. S. Department of Commerce. For the first eight months of the year, personal income was at the annual rate of \$284 billion, almost \$20 billion higher than in the same period of last year.

Total sales of all retail stores in August amounted to \$14.2 billion, nearly 6 per cent above August 1952.

Industry Urged to Develop Its Engineers

CARLOS E. HARRINGTON, speaking at the fall meeting of the American Society of Mechanical Engineers, called on industry to bring out the best qualities of the engineers it hires. The broadening of the engineer by conferences might be extended by his activity in engineering societies, where he can discuss his problems with fellow engineers, Mr. Harrington pointed out. "To management this has a sales advantage because it presents the company name to those who greatly influence purchasing. Aside from the broadening effect on the engineer himself, it acquaints a very select group with the activities and product of his sponsor," Mr. Harrington stated.

Furnace Shipments Show Gain Over 1952

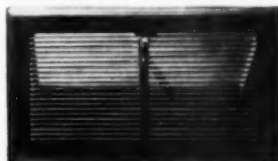
SHIPMENTS of winter air conditioning units and warm air gravity units for the first seven months of 1953 totaled 498,646. In a similar period of 1952, 406,992 units were shipped. Of the 432,599 winter air conditioning units shipped in 1953, 233,884 were gas fired, 191,427 oil fired, and 7288 coal fired. Totals for the January-July 1952 period were: 177,522 gas fired units, 151,111 oil fired, and 8395 coal fired. Gravity units shipped in the first seven months of 1953 totaled 66,047—down 3917 from



The Right Register FOR YOUR CONVENTIONAL INSTALLATIONS

Your best source of conventional registers is still Char-Gale, whether you are installing forced air systems, gravity systems, or both. While introducing many improvements in the small pipe system, we at Char-Gale want to remind you that we are continuing our production of conventional registers. They're still coming off our production lines to give you proper air distribution and customer satisfaction. For more information, contact your jobber.

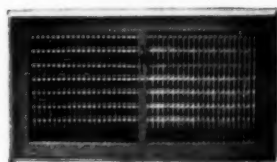
for **FORCED AIR SYSTEMS**



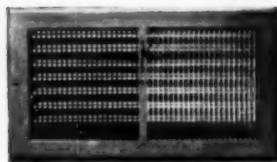
STYLE 400 Single Valve
Baseboard Register



STYLE 410 Single Valve
Sidewall Register



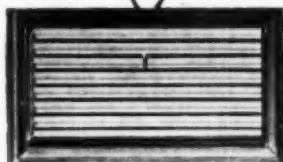
STYLE 402 Multiple Vane
Baseboard Register



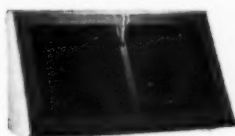
STYLE 412 Multiple Vane
Sidewall Register



Rear View STYLES 400 and 410



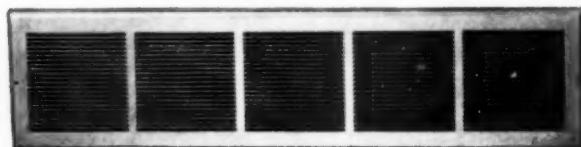
Rear View STYLES 402 and 412



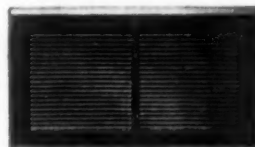
STYLE 403 Single Valve
Out-of-Wall Register



STYLE 418 Return Air
Out-of-Wall Register



STYLE 415 Return Air Baseboard Vent (Long)
STYLE 420 Return Air Sidewall Vent (Long)



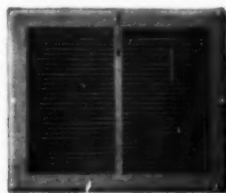
STYLE 415 Return Air Baseboard Vent
STYLE 420 Return Air Sidewall Vent

Also

**SPACE-
SAVING
TIME-
SAVING
LABOR-
SAVING
CHAR-
GALE
PACKAGED
FITTINGS**



STYLE 810, 812, 912, 1113
Baseboard Register



STYLE 807 and 808
"Wafer" Sidewall Register

for **GRAVITY SYSTEMS**



Floor Register



Steel Face Return Air Floor Register

**CHAR-GALE
MANUFACTURING COMPANY
MINNEAPOLIS-MINNESOTA**

the editor's notebook

(continued)

the 1952 figure of 69,964. Of the 1953 total, 31,159 were gas fired units, 9406 oil fired, and 25,482 coal fired.

These figures are reported by the National Warm Air Heating and Air Conditioning Association.

Conditioners Installed Within Building Line

AN INGENIOUS room air conditioner installation, in Havana, provides an answer to the problem of how to install a room air conditioner where rules forbid protrusions past the building line.

Two $\frac{3}{4}$ ton units were needed in an oculist's office containing only one outer wall. The air conditioners were placed one under the other in attractive wooden frames.

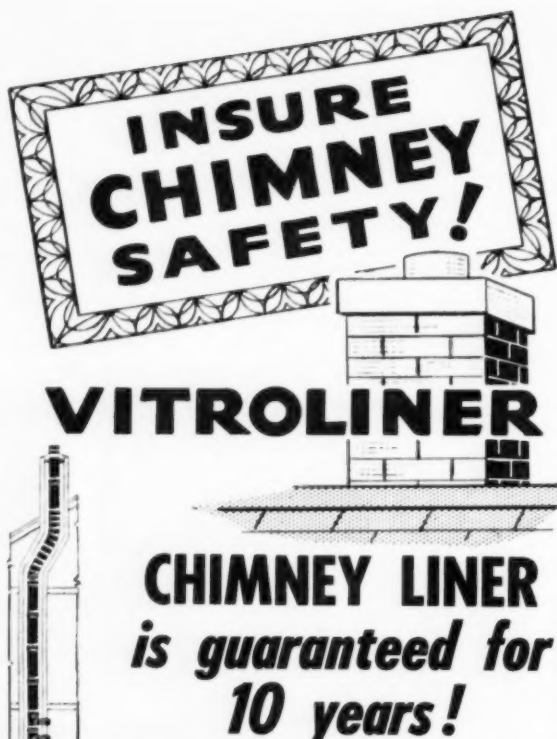
The 16 $\frac{3}{4}$ in. outer cabinet was brought within the building wall line by constructing 6 in. extensions, made of wood and painted to blend with the interior color scheme to look like attractive window frames.

The remaining portion of the outer cabinet is enclosed within the outer wall, with enough space left for a decorative wood or metal louvered grille, which can be added to "clean up" the outside appearance.

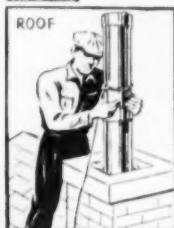
Revolution in the Weather?

THE TEMPERATE zone is moving northward, affecting future economic life all over the world and the center of industrial power, according to a new book by William J. Baxter, *Today's Revolution in Weather*.

One theory the author advances is that increased carbon dioxide in the atmosphere is at least partly responsible by preventing the radiation of heat from the earth.



Vitroliner is the only chimney liner guaranteed in writing to give effective and continuous service. Here's why —



1. Vitroliner is impervious to acids and salt air conditions. Modern fuels like gas and oil will not harm VITREOUS ENAMELED Vitroliner.

2. Masonry chimneys are completely protected. The combustion gases are kept in the liner away from the brick and mortar.

3. Vitroliner creates better draft, greater efficiency in the heating unit, and reduces fuel consumption.

4. Tried and proven successful for over 20 years. The oldest chimney lining installations are still in good operating condition.

If you want to use the best product for chimney lining write today and get the full story. The demand for Vitroliner is growing in every city with the demand for modern fuels.

Ask about our insulated liners.

CONDENSATION

ENGINEERING CORPORATION

1511 W. POTOMAC AVE., CHICAGO 51, ILL.

the editor's notebook

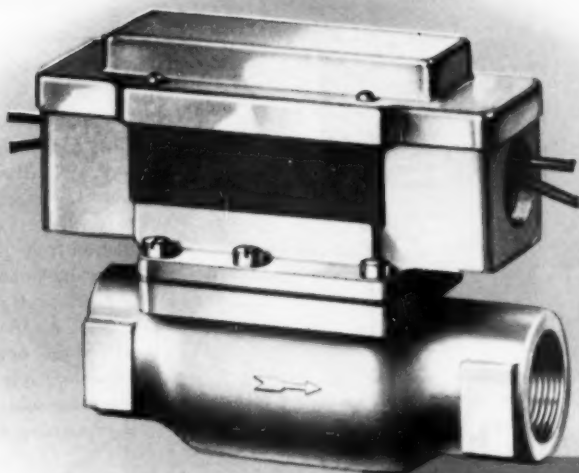
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1 1/2 Million More Will Have Cooling This Year

CLOUD WAMPLER, president of Carrier Corp., predicts that this year over 11 $\frac{1}{2}$ million Americans will join the ranks of those with room air conditioners or year 'round residential units installed in their homes. "This is considerably more than the total number of people who had home air conditioning during the seven previous years," he said. Charles V. Fenn, vice president and general sales manager, Machinery and Systems Div., stated that the corporation's orders for central air conditioning and refrigeration systems through the end of August were 42 per cent above those for the same period in 1952. This represented a rise of nearly four times the average annual growth in sales of such equipment since World War II.

West Coast Gas Industry 100 Years Old

MORE THAN 1000 delegates attended the three day Pacific Coast Gas Association diamond jubilee convention held in San Francisco. James S. Moulton, president of the association, said some authorities predict a 40 per cent increase in Pacific Coast gas sales in the next five years. He said that transmission of natural gas into California from Texas and New Mexico would approach 75 per cent of the state's total consumption by the end of 1953 alone. Frank C. Smith, president, American Gas Association, said that 15 years ago the gas industry represented a \$5 billion investment but that it now has increased to \$12 billion, and the investment is expected to grow to \$16 billion in the next four years.



you asked for ACTROL

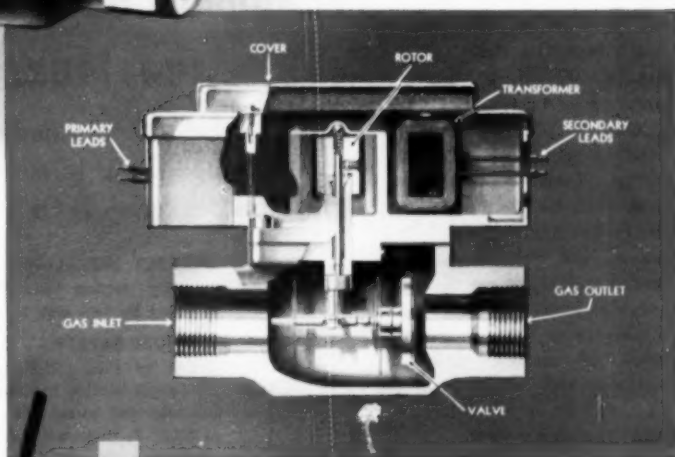
Here it is!

You asked for a quiet main control valve . . . one that would be simple and trouble-proof . . . one that would be easy to install and service. The Actrol valve gives you all this and more.

Actrol is actually *silent* because the valve floats to a stop instead of hanging against the end of a plunger tube. For this reason, too, *the valve cannot stick open.*

The strongest force is exerted at the beginning of the stroke when the valve must open against gas pressure.

The built-in transformer—a current limiting type—saves the expense and inconvenience of mounting a separate transformer



unit. It can be turned end for end to facilitate wiring. It is replaceable.

The Actrol valve can be installed at any desired angle around the centerline of the body, and any part of the unit can be serviced without removing the valve body from the line. Added to all that, Actrol's low power requirement insures long thermostat point life. Indeed, Actrol is the valve you asked for . . . and more.

MILWAUKEE GAS SPECIALTY CO.

Dept. AA-4

MILWAUKEE 2, WISCONSIN



Write for more
information.

the editor's notebook

(continued)

More Aluminum Available Soon

REYNOLDS Mining Corp. has begun the development of its aluminum ore reserves in Haiti. Construction equipment has been sent to Haiti to prepare the shore site and to build a 12 mile mountain road descending from an altitude of 3000 ft.

Sees Growing Use of Coal as Energy Source

PHILIP H. COOMBS, executive director of the President's Materials Policy Commission, discussing the nation's energy resources, pointed to coal as an outstanding source of potential energy. "Coal stands as the great white hope for the long run in the energy field," he said. "Not only is it our most abundant reserve of fuel—it also lends itself flexibly to conversion into secondary forms of energy, notably electricity and liquid fuels."

Ease Requirements on Tax Form

BUSINESSMEN were pleased to learn, following a meeting of T. Coleman Andrews, Commissioner of Internal Revenue, with representatives of the National Chamber of Commerce, National Association of Manufacturers, American Retail Federation, and others, that it will not be necessary in all cases to provide all information requested in Form 720, the Internal Revenue Service's new type of return for reporting excise taxes. Mr. Andrews issued a statement to the effect that taxpayers will be permitted to fill out the new form "to the extent feasible under the system of accounting employed by the taxpayer." In the meantime, he promised that the Internal Revenue Service will try to work with interested business



Packaged Chimney Housing Looks Like Massive Brick

Now . . . the low installed-cost of a Van-Packer Packaged Masonry Chimney with the sales appeal of a "brick" housing



QUICKLY INSTALLED — Complete packaged masonry sections and chimney housing assembled by two men in 97 minutes.

ALL-FUEL SAFETY — Listed for home heating plants by U.L., F.H.A., and all major codes. Acid-proof fireclay tile lining and 3" vermiculite concrete wall withstands temperatures in excess of 2000° F. Underwriters' Laboratories states no clearance to wood construction members necessary.

EFFICIENT, PERMANENT — Develops 34% more draft than standard code brick chimneys. Not a temporary metal pipe, but a lifetime masonry chimney.

NEW SIMULATED BRICK HOUSING — Molded 3/16" asbestos panels brick embossed and pre-painted brick red. If desired, easily repainted on the job to match other brick colors. Massive appearance, measures 16 1/2" x 24". Fits any roof ridge or pitch.

LOW COST — Saves 50% on time and material over brick chimney construction.

IMMEDIATE DELIVERY — Nationally distributed. See your local heating or building material dealer or jobber. Write Van-Packer for full details.

VP Van-Packer

PACKAGED MASONRY CHIMNEY WITH NEW SIMULATED BRICK HOUSING

Van-Packer Corporation
Dept. 3 - 209 S. LaSalle Street - Chicago 4, Ill.

Also manufactured and distributed in Canada by
C. A. McRobert and Son, Ltd., St. Laurent, Quebec

the editor's notebook

(continued)

representatives to perfect this tax form.

Chief objections of those who attended the meeting were that the form is complicated, making it necessary to re-figure excise tax information from July 1, 1953 and upsetting established accounting practices.

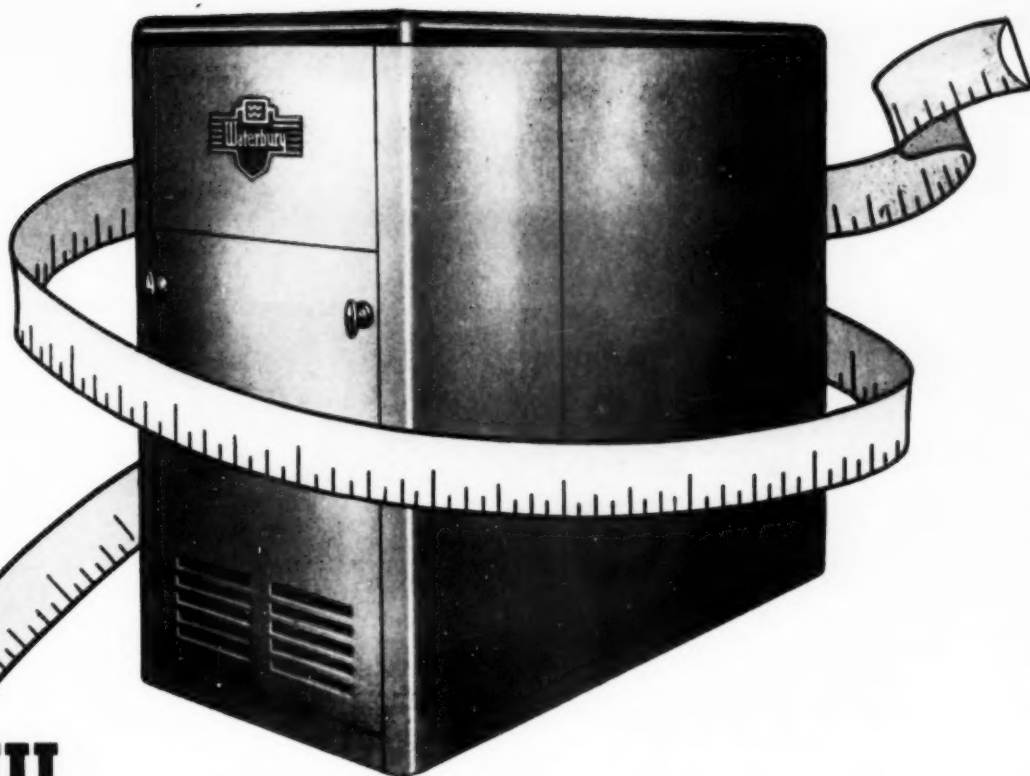
Mr. Andrews stated that where the new form cannot be completely filled out, a statement must be attached to it explaining why.

Use "9" to Track Down Check Book Errors

AN ARTICLE in a recent issue of the Journal of Accountancy gives a suggestion for catching the error that throws your checking account out of balance. The article points to the mental quirk which causes us to dial 3200 instead of 2300 on the telephone. The same human frailty "transposes" 23 cents into 32 cents on a check stub. Oddly enough, the error is always a multiple of nine. Moral: If your checkbook is out of balance by 9, 18, 27, 36, etc., you should suspect a transposition. A further help tells you which numbers may be transposed. For example, if your balance is wrong by 72, divide by 9 and the answer is 8. This means the difference between the transposed digits would be 8. Thus you look for errors involving 80, 08, 91, or 19.

Oil Burner Shipments Up

SHIPMENTS of residential oil fired conversion burners for the first eight months of this year, according to a report from Oil-Heat Institute, totaled 332,381, up 21 per cent over 1952. Oil fired residential furnace-burner units totaled 148,210 for the first eight months, up 36 per cent over 1952.



Waterbury . . . for good measure

**FURNACES
WINTER AIR CONDITIONERS
GAS CONVERSION BURNERS**

"A product is best judged by its quality. Manufacturer, distributor, dealer and consumer all know that quality above all else sells and satisfies."

Performance of product, as well as a sound dealer policy, are two reasons why more and more dealers are choosing Waterbury. That added measure of dependability plus the added measure of interest Waterbury has in its dealers, makes the Waterbury choice a good one.

Every Waterbury unit must meet the highest warm air heating standards, which means maximum efficiency, economy, and dependability from every Waterbury . . . satisfaction for customer and dealer alike.

The Waterman-Waterbury policy is clearly stated. It includes exclusive distribution rights, a close, personal relationship between dealers, distributors, and factory, and a complete line of quality equipment. Yes, dealers find that association with Waterbury is good business.

"It's what's under the casing that counts!"

The **Waterman-Waterbury Co.**

OVER 46 YEARS OF WARM AIR HEATING

1122 Jackson Street N. E.
Minneapolis 13, Minnesota

Peerless Blowers Build

Blowers that are competitively priced . . .

This is the season when closed doors create smoke, fumes and stale air conditions . . . people want belt and direct drive blowers that will solve the problem . . . sell them the Peerless line for quick and long-term profits.

Mr. Distributor and Mr. Dealer —

Check the Peerless "sales-plusses" . . . complete, ready-to-install units . . . Peerless Guarantee . . . Peerless Registration . . . Peerless Rugged Motors . . . one supplier!

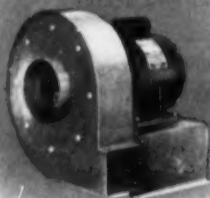
Add Peerless Blowers' heavy-duty, arc-welded housings . . . job-matched motors . . . rigidly engineered construction . . . features that put an end to expensive call-backs!

Use Peerless engineering service with your own sales knowledge to sell those tough middle-sized jobs.

Compare Peerless' competitive prices and you'll see why it's to your direct advantage to sell Peerless Blowers.

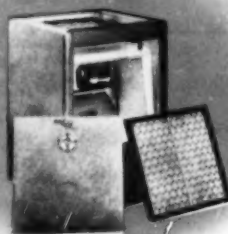
Put those Peerless "sales-plusses" together and they spell just one thing for you . . . P-R-O-F-I-T-S . . . PROFITS!

If you have a fan or blower job that needs immediate attention, call Peerless and ask for the Fan and Blower Division. Wholesalers and dealers are delighted with Peerless service policy, products and the prices!



PRESSURE BLOWER

Large air volume at high static pressures. Self-cleaning paddle wheel. For small exhaust systems where dust and grit content is high. Dynamically balanced blades. Heavy-gauge steel base and housing.



BLOWER-FILTER PACKAGE UNIT

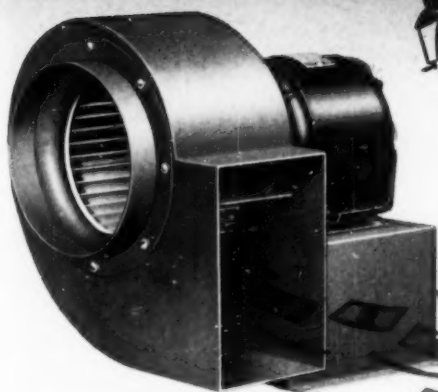
Ready-to-install for greatest value in warm air heating. Textured green enamel finish. Bearings and blower mounted on rubber. Felt pads on cabinet opening. Motors have thermal overload protection. From 1,100 to 6,600 C.F.M.

"SMOOTHEST PERFORMERS ON THE MARKET"

**Peerless
Electric**

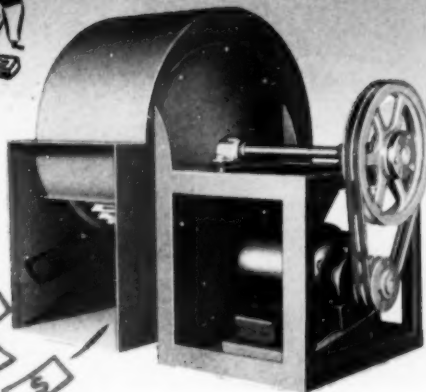
FAN AND BLOWER DIVISION

Fall and Winter Profits...



DIRECT DRIVE BLOWER

Powered by premium-built, job-matched Peerless motors from 1/6 to 2 HP for general exhaust and ventilation where large volumes of air at economical cost is important. Housing can be set in eight different positions for discharge at any angle. Each unit registered and guaranteed.



BELT DRIVE UTILITY BLOWER

Matched with Peerless Electric Motor. From 1/6 to 7-1/2 HP. Housings are convertible. Blowers for counterclockwise rotation furnished as specified. Arc-welded frames and housings. All units have Peerless registration and guarantee.



Wheels 18" in diameter and larger are welded. Sizes 27" have three tie-rods for extra rigidity. Wheels dynamically balanced.



On blowers 15" in diameter and smaller... riveted construction... dynamically balanced... vibration-free operation at high speeds.



PVB EXHAUST FAN

For continuous movement of dusty, humid air in factories, warehouses, foundries, etc. Totally enclosed ball-bearing motor. Motor pulley adjustable for lower fan speeds. Vertical or horizontal mounting. Heavy-duty industrial type. Quiet.



PVS EXHAUST FAN

Four lag screws mount it horizontally or vertically. Ball-bearing motor is totally enclosed. Quickly exhausts smoke, fumes or odors. Fans furnished with one- or two-speed controllers. Easily installed in round or square opening.

THE PEERLESS ELECTRIC COMPANY

1405 WEST MARKET ST. • WARREN, OHIO



Dealer Harold Westrich, left, talking over Zone Control problem with Honeywell sales engineer Cal Duke.

"The way modern homes are laid out, one thermostat isn't enough"

says Harold Westrich, president, Adams Furnace Co., St. Louis

"And that means not only the more expensive houses, but a lot of the smaller homes, too.

"We work very closely here with a number of architects and quite often we're asked to analyze and then explain to their clients what the heating requirements of the home will be.

"So we have a lot of opportunity to tell people why they need Honeywell Zone Control.

"The reasons vary with every house, but more

often than not there's a problem of exposure or of the use of a lot of glass in a certain section of the house. Or maybe it's simply that the layout of a house requires that the sleeping area be controlled separately from the living area.

"Whatever the reasons, they add up to the fact that for many modern houses a single thermostat isn't enough. And that calls for one thing—Honeywell Zone Control."



*Another Plus-Profit
Idea from Honeywell*



"The simple logic of the Honeywell Zone Control story sold the Klingensmiths"

"After architect Paul Klingensmith and his wife had worked out the floor plan above for their combined home and office, I saw it was a natural for Zone Control.

"I told them so—and told them why.

"They'd divided the house into two distinct areas, by floors. The upstairs contained living quarters. The downstairs contained office and service areas.

"With a separate thermostat downstairs, they

could maintain any comfort level they wanted for daytime activities. Then in the evening the temperature could be lowered to save fuel.

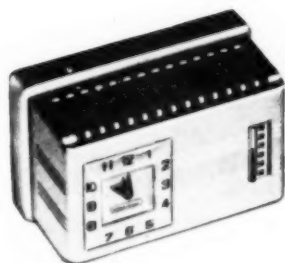
"With a separate thermostat upstairs they could maintain cooler temperatures during the parts of the day when the zone was unused.

"The simple logic of this convinced the Klingensmiths—and sold them on Honeywell Zone Control.

"And it added up to a nice extra profit for me."

Honeywell has controls for any type zone job!

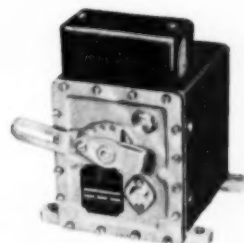
Here are three examples:



Electronic Chronotherm—famous, fully automatic clock thermostat. Provides night shut-down, automatic morning pick-up for 24-hour control.



Electronic Weathercaster—located outside the house. It senses changes in the weather, and signals the electronic system indoors, automatically.



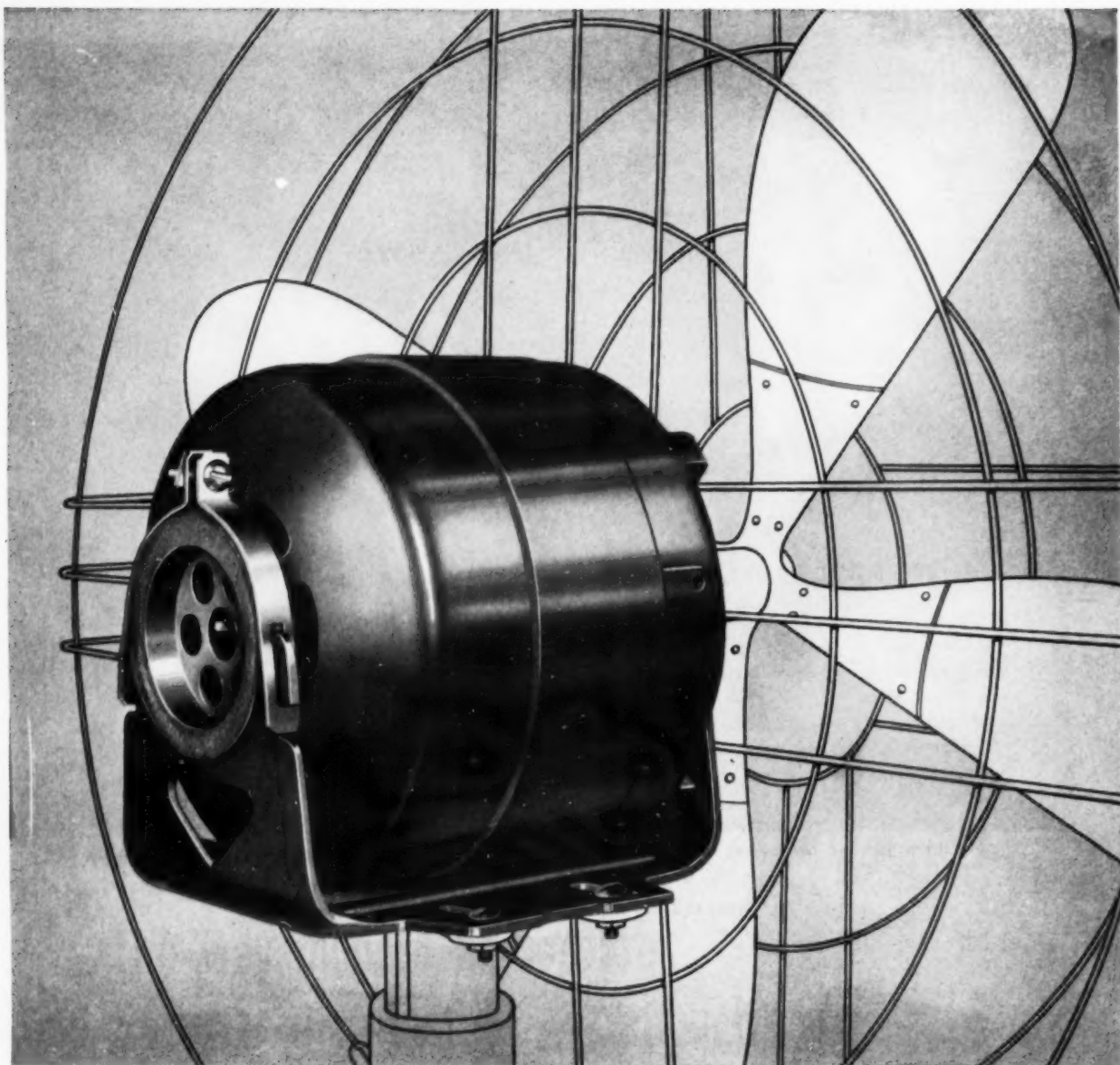
Modutrol motor comes in several versions. It gives fast, accurate control of dampers and valve assemblies, gives years of trouble-free service.

For complete information and application data on Honeywell Zone Control, call the Honeywell office nearest you. There are 104 of them located across the country. Or write Honeywell, Dept. AA-11-97, Minneapolis 8, Minn.

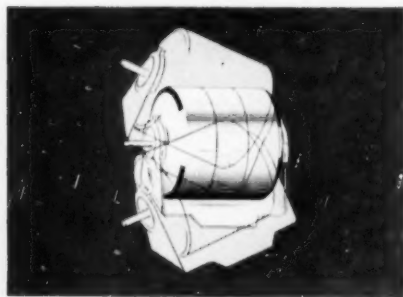
MINNEAPOLIS
Honeywell



First in Controls



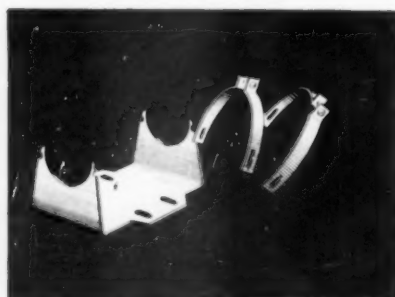
Here are *SIX* good reasons why your product



1 VERSATILE all-angle unit bearing design and sealed-in lubrication system permit motor to be mounted in any position.



2 ATTRACTIVE APPEARANCE of motor improves the appearance of your product in applications where the motor will be visible.



3 MOUNTING CONVENIENCE helps solve product design problems. Use resilient cradle-base or end-ring mounting.

This motor drives a ventilating fan . . .

G-E shaded pole motors can help sell your products too

Ventilating fan manufacturers know that a quality product needs a quality motor. That's why so many specify G-E shaded pole motors and profit from their choice.

Your products, too, whether cooling fans, unit heaters, condensing coolers, exhaust fans, evaporative coolers, or others, can be made better to sell faster with versatile G-E shaded pole motors.

The things you need in a motor—all angle operation, with shaft up, down, horizontal, or in between, lubrication for life, light weight and quiet operation—are all features of the G-E shaded pole motor. And the application of a simple control permits the use of this motor for adjustable speed operation.

In addition, permanent lubrication system virtually eliminates costly maintenance problems. Its practical, smooth finish and trim, symmetrical design make the G-E shaded pole motor a unit that will give your product a hard-working, functional appearance.

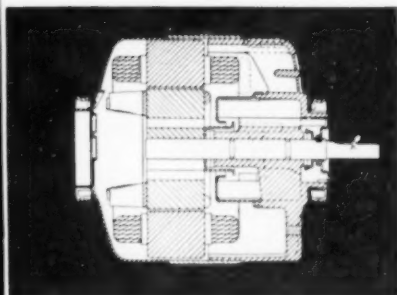
For full information on available ratings, contact your nearby G-E Apparatus Sales Office today. General Electric Company, Schenectady 5, N. Y.

704-20

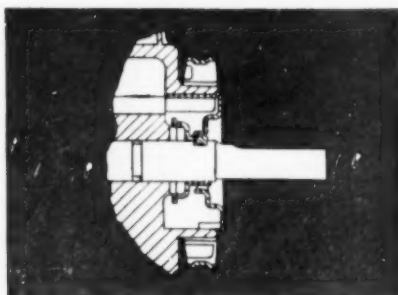
You can put your confidence in—

GENERAL  ELECTRIC

should use a G-E Shaded Pole Motor



4 QUIET OPERATION is a feature everyone wants. This is gained by accurate alignment and positive lubrication.



5 LUBRICATED FOR LIFE avoids inconvenience of adding lubricant . . . reduces maintenance to a minimum for dependable operation.



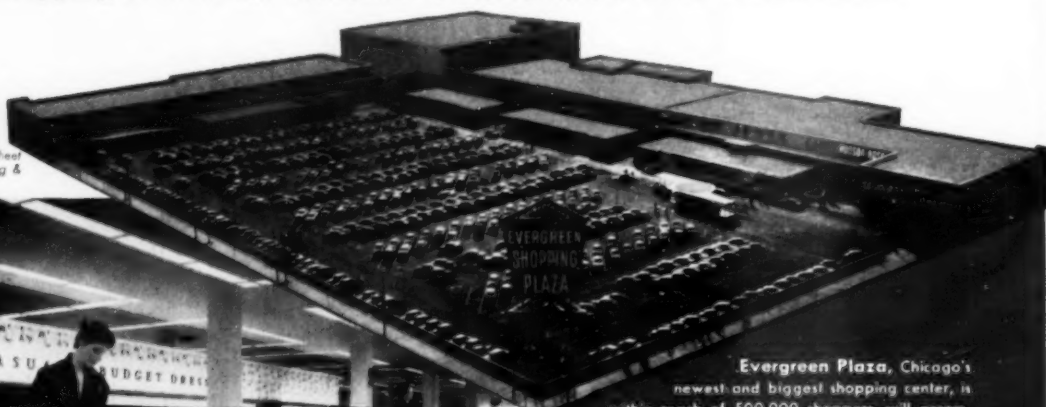
6 "EQUIPPED WITH G-E MOTOR" helps sell your product by backing it up with G.E.'s reputation for quality motors.



"UNI-FLO" ENGINEERED Air Distribution

New Uni-Flo High Velocity Systems provide modern shopping comfort for thousands of customers in EVERGREEN PLAZA

Evergreen Plaza, Chicago, created by Arthur Rubloff Architects and engineers for The Fair, Halabard, Root & Burgee. Air conditioning contractor: Carrier Corporation. Sheet metal contractor: Narowetz Heating & Ventilating Co.



Evergreen Plaza, Chicago's newest and biggest shopping center, is within reach of 500,000 shoppers, will accommodate 2,200 parked cars, is grossing \$40,000,000 annual volume.

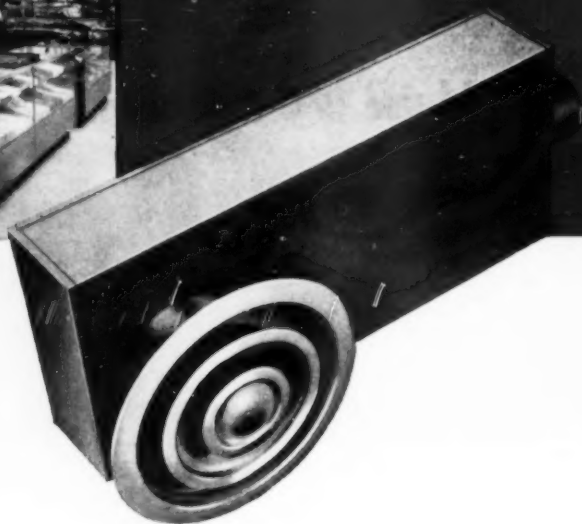
◀ **Spacious, well-lighted, comfortable shopping areas** characterize The Fair and other stores in the Plaza.

◀ **Trim, modern Venturi-Flo Ceiling Diffusers** provide an ample supply of conditioned air, quietly, throughout The Fair.



Answer to high velocity distribution problems is this compact Uni-Flo High Velocity Control Unit shown with Venturi-Flo Ceiling Diffuser attached. Control Unit is available also with Uni-Flo Square Ceiling Diffuser or Sidewall Diffuser. Complete engineering data on capacity, pressure drop, and decibel ratings are available from your nearby Barber-Colman Field Office (consult classified directory).

Photographs of The Fair interiors, courtesy Grand Rapids Store Equipment Co.



Stores in Chicago's Evergreen Plaza, called "America's Finest Shopping Center," have set new standards in modern design and equipment for retail establishments.

Typical advances in design, lighting, fixtures, and air conditioning are symbolized by the four-story branch of The Fair, pictured here. As one way of making certain that every cubic foot of space was utilized for greatest shopper comfort and convenience, the latest development in space-saving high velocity air distribution systems was specified. Operating against a head of 6" static pressure, the fan forces conditioned air through small size, concealed ducts terminating in branch velocities of 2500 to 3000 fpm. 400 High Velocity Control Units reduce the high pressure, high velocity air to normal flow

at points of delivery, with whisper-quiet results.

Easily adjusted, streamlined Venturi-Flo Ceiling Diffusers attached to extensions from the High Velocity Control Units are the only visible evidence of the system. The air distribution system is easily balanced . . . and the public shops in a fresh, draft-free atmosphere.

Conventional Uni-Flo air distribution equipment is used in other famous stores in the Plaza, such as Lytton's and Mach Importers.

Benefit from Barber-Colman's extensive research and development work on high velocity air distribution products. Call your nearby Field Office for help on applications in new or old buildings . . . or send coupon below for new booklet "High Velocity Air Distribution."



Popularity of shopping center is demonstrated by the thousands who turned out for opening day at The Fair.



Fresh, conditioned air stimulates appetites in The Fair's Terrace Room.



Uni-Flo High Velocity Control Unit reduces high velocity, high pressure air to conventional flow.



Extension collar from Uni-Flo High Velocity Control Unit projects down through metal lath.



Venturi-Flo Ceiling Diffuser has adjustable deflection and volume control . . . distributes air efficiently, quietly.



"UNI-FLO" ENGINEERED Air Distribution

Air Distribution Products • Automatic Controls • Industrial Instruments
Aircraft Controls • Small Motors • OVERdoors and Operators • Molded
Products • Metal Cutting Tools • Machine Tools • Textile Machinery

BARBER-COLMAN COMPANY, ROCKFORD, ILL., U. S. A.
Dept. K, 1106 Rock St. • Field offices in principal cities

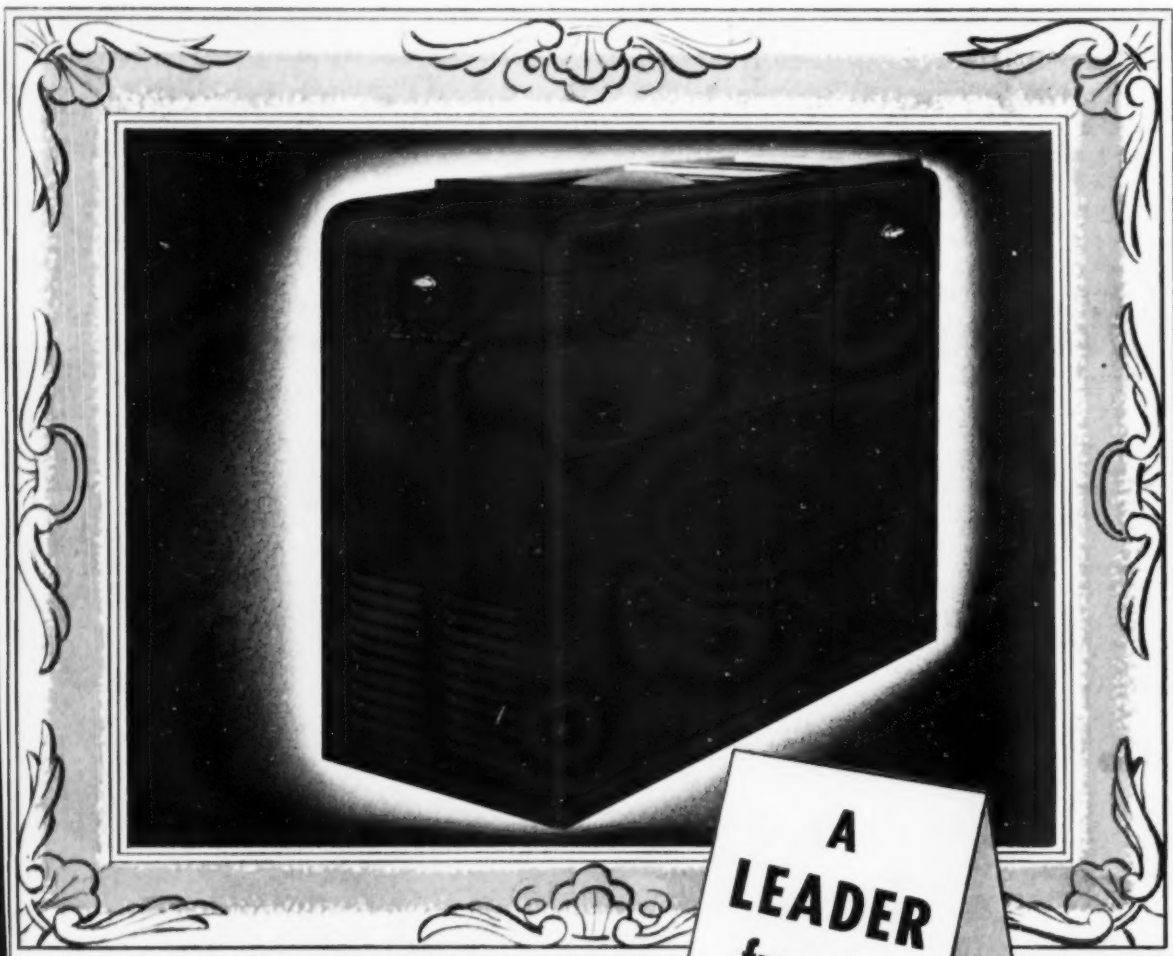
☐ Send free booklet "High Velocity Air Distribution"
F-5772, with performance and descriptive data.

Name

Firm Name

Address

City State



Mueller Climatrol

TYPES 116-216 WINTER AIR CONDITIONERS
90,000 - 110,000 - 130,000 and 150,000 Btu input

A
LEADER
from the
LEADER

**Another big important reason
why Mueller Climatrol is the BIG NAME in heating**

THE Mueller Climatrol Type 116-216 is designed to please your customers, help ease your installation job. It's pre-wired and pre-assembled, cuts your labor time, increases your profits. Because it's shipped in two sections, it goes down narrow, winding basement stairways without trouble.

The Type 116-216 is compact; is available in four sizes—90,000, 110,000, 130,000 and 150,000 Btu input.

Another thing! The Type 116-216 has famous Mueller Climatrol Designed Convertibility. Install the unit with the oil now — convert to gas later and get the same top efficiency.

Go over this top-notch heating plant. Look for the many superior built-in features. Heavy-gauge, welded-

steel heat exchanger; free-floating radiator, connected to drum at back only — and large blower — for quiet operation. The Type 116-216 is easy to sell because it's the best home-heating plant manufactured today!

Write today for descriptive literature to Mueller Climatrol, 2030M West Oklahoma Avenue, Milwaukee 15, Wisconsin.

D-156



Mueller Climatrol

Automatic Humidifiers

**A COMPLETE LINE
WITH A TYPE and SIZE
FOR EVERY
WARM AIR FURNACE**



THERMO-DRIP

Gives furnace owners the most efficient, most dependable way to put moisture in the air. Valves don't lime up. No stagnant pool to reheat. Sensitive thermostat. Easily installed. Water drips into pan only after pan is sizzling hot. This puts the most moisture into the air stream when it is most needed.



THE VAPORITE 555

Completely assembled for lowest cost installation . . . uses Automatic humidifier drip feed principle. Positive thermostat control feeds water to vapor pan according to heat. Pan is dry when furnace is cold. Stainless steel pan insures rapid heat transfer to water. One size, one kit slashes time and labor cost.



NEW VAPORITE 577

Made especially for sloping bonnet furnaces, but adjustable so that it can be installed just as easily on straight bonnets. Preassembled for fastest installation. Can be adjusted to any angle of bonnet pitch with an ordinary screw driver. No hard-to-get-at nuts and bolts. No iron framework to level the vapor pan. Made of stainless steel. Weighs less than 4 pounds. Vapor pan is supported permanently and rigidly in level position. Cannot sag.



VAPORITE SERIES 500

Uses famous drip feed principle of putting moisture into the air . . . a measured amount at a time. Thermostat accelerates drip rate as furnace becomes hotter. Cuts down rate as furnace cools. This keeps air properly balanced with moisture at all times. Uses stainless steel pans.



MODEL CF500

FOR COUNTER FLO FURNACES

Makes healthful humidified warm air available in homes with perimeter systems. Requires no pans to buy or install. Bottom of plenum chamber in concrete floor is evaporating surface. Drip feed automatically accelerates or shuts off as furnace temperature fluctuates. When furnace is not in use, plenum chamber is dry.

A-113

Write today for free literature on these most efficient, most dependable humidifiers.

AUTOMATIC HUMIDIFIER COMPANY • CEDAR FALLS, IOWA



TOP-NOTCH REGISTERS

FOR EVERY TYPE OF

Installation

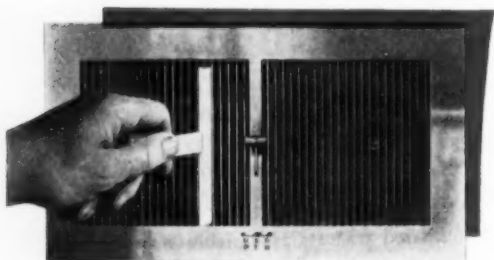
QUALITY FURNACE ACCESSORIES

Whether it be for perimeter heating (sidewall, floor or baseboard installation), any of the conventional air conditioning installations or gravity, the H&C Line provides the top ranking register in each class. And in addition, quality furnace accessories such as Damper Tips and Clips, Damper Regulator Sets, Furnace Chain and Pulleys, etc.



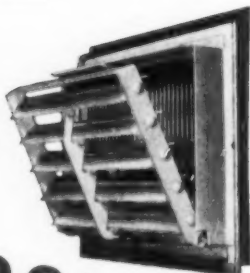
PACKAGED FOR YOUR CONVENIENCE and PERFECT PROTECTION!

... one of the many plus features that make it extremely satisfactory and profitable to deal with H&C.



H & C No. 75

One of the Quality Registers in the H&C Air Conditioning Line. Features the incomparable Turning Blade Valve that decreases resistance as much as 30% and gives perfect air distribution to the farthest parts of the room. Used in over 1/2 million installations.



All register items and most accessories are packed in individual cartons for easy dispensing from jobber to dealer and complete protection to the point of installation . . . shipped in strong fibre, easy-to-handle cases . . . in quantities which are small enough to make it easy for the trade to buy in case lots.

for THE BEST IN REGISTERS

for ALL your needs and for pleasant profitable customer-dealer relationship you can bank on H&C year in and year out. Current Catalog No. 52.

HART & COOLEY

500 EAST EIGHTH ST., HOLLAND, MICH.

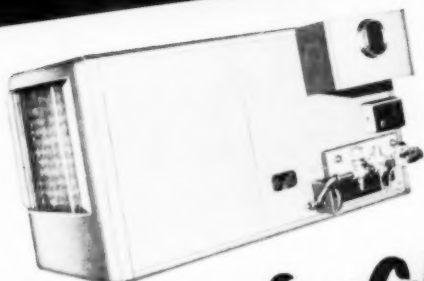
In Canada Hart & Cooley Manufacturing Co., Fort Erie, Ontario

MANUFACTURING COMPANY



PRODUCT OF THE WORLD'S LARGEST and MOST PROGRESSIVE PRODUCERS OF REGISTERS and GRILLES

Luxaire[®] HORIZONTAL FURNACES Gas Fired - Oil Fired



2 sizes for GAS
65,000 B. T. U. Input
85,000 B. T. U. Input



2 sizes for OIL
84,000 B. T. U. at Bonnet
123,000 B. T. U. at Bonnet

Factory Assembled for Quick—
Easy Installation



**UNUSUALLY
COMPACT**

IN
Design and
Construction

For
Installation in
**SMALL AND
LIMITED AREAS**

in
Attics . . . Lofts . . .
Crawl Spaces

OVERHEAD

In Utility Rooms . . .
Closets . . . Basements

•
Applicable to various types
of commerical installations
Stores — Churches — Service
Buildings — Warehouses

See your Luxaire jobber today! — Get the story on the biggest value in Horizontal Furnaces! — Get the story on the complete Luxaire line—a furnace for any type or size of heating installation. Get the low, competitive prices on Luxaire.

THE C. A. OLSEN MANUFACTURING COMPANY • ELYRIA, OHIO

Luxaire

HEATING & AIR CONDITIONING UNITS

These sales-proved accessories add **MORE PROFITS** to your oil heater sales

EVERY oil-burning heating appliance customer is a prospect for these high-profit A-P accessories. Automatic heating, automatic oil lifting and clean fuel oil in the burner . . . they're all advantages that mean extra sales, extra profits for you. So, join the thousands of satisfied dealers all over the country who are cashing in on this profit-packed line. Stock A-P, display A-P and you'll profit with A-P. Write today to — A-P CONTROLS CORPORATION, 2452 N. 32nd St., Milwaukee 45, Wis.

Sell automatic heating



Exclusive actuating pin on A-P manual oil controls permits quick attachment of all A-P conversion tops for automatic heat control.



This Thermomatic Comfort Control provides automatic heating with no wiring — no electrical connections. Fits on manual control nameplate. Low in cost . . . no installation . . . no service.



Electric Conversion Kit provides regular room thermostat heat control for vaporizing oil-burner, space heaters and furnaces. Any owner can install. Comes complete with transformer, wire and insulated staples.



Electric Conversion Kit provides simple room thermostat heat control for fan-type heaters. For use either with draft fan or circulating blower on heaters and furnaces. For "on-off" or "high-low" fan speed control.

Sell automatic oil lifting

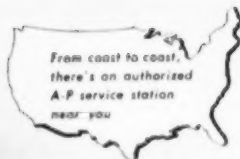


Cash in on clean, easy fuel oil handling with an A-P Oilifier. Draws oil from tank or drum located outside or in basement. Delivers it to the third floor, if necessary.

Sell increased efficiency



Cash in on freedom from danger of burner failure due to dirt, moisture or impurities in oil . . . with an A-P Fuel-Oil Trap-It. Eliminates costly service calls by preventing sluggish operation or flame failure due to erratic flow.



From coast to coast,
there's an authorized
A-P service station
near you

A-P CONTROLS CORPORATION



DEPENDABLE Controls

For Air • Gases • Refrigerants

In Canada: A-P Controls Corp., Ltd.
Cooksville, Ontario
For Export: 13 E. Fortieth St.,
New York 16, N. Y., U.S.A.

Ready NOW for
tomorrow's dream houses



New TORIDHEET

WALL FLAME *Counterflow* FURNACE



Designed for perimeter and floor panel
heating in new basementless homes

Model ORD counterflow oil furnace is as modern as tomorrow—the perfect answer to efficient trouble-free heating of new basementless homes. Here's why it's right for ground floor installations.



Whisper-Quiet Operation—The famous TORIDHEET Wall Flame burner used in the ORD counterflow furnace is self-lubricating, has only one moving part. It's the most quiet heating mechanism yet devised.

Minimum Floor Space—Model ORD base dimensions are only 28"x28"—fits easily in even the smallest house plan, yet its 100,000 Btu bonnet rating is sufficient to keep an average size home comfortable in sub-zero weather.



Unmatched Economy—Model ORD TORIDHEET Wall Flame burner has proved fuel savings of 25% to 50% over oil burners of other types.

Tops In Safety—Automatic controls are underwriter approved room thermostat, primary control, fan and limit control, and secondary limit control on blower deck to guard against overheating in event of blower failure.



Famous TORIDHEET Wall Flame burner used in Model ORD counterflow furnace burns catalytic oil with top efficiency.

...For Conversion jobs and in complete heating plants

Other TORIDHEET units for every need...every budget...Gun Burners...Gun Fired Boilers and Furnaces...Gas Conversion Burners and Gas Fired Furnaces.

CLEVELAND
Toridheet
AUTOMATIC HEATING

TORIDHEET DIVISION
CLEVELAND STEEL PRODUCTS CORPORATION
7318 Madison Avenue Cleveland 2, Ohio

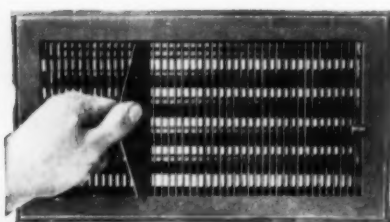


"WORLD'S FINEST"

**Residential — Perimeter — Commercial
Air Conditioning Registers and Grilles**

"Finish '53, begin '54 with these

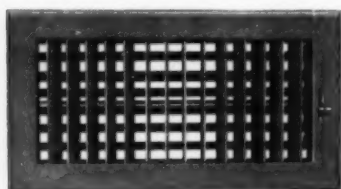
proven profit lines"



No. 256 MULTIPLE VALVE

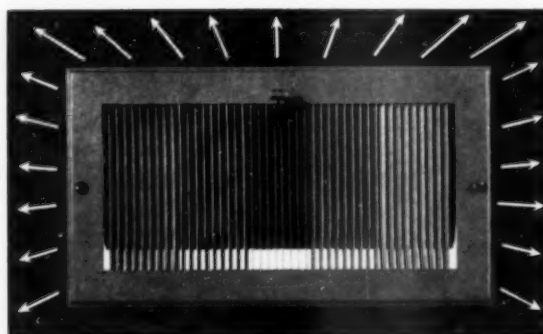
The Standard of Excellence for Residential Air-Conditioning

Many have tried — none have succeeded — in designing a register to equal U. S. No. 256. Its trim, neat exterior is worthy of the finest homes. Its real beauty — from your standpoint — is its complete versatility for any installation situation. Pipes can come from any direction top, bottom, back, right, or left — yet you get perfect air distribution in any direction by your setting of the multiple valves and diffuser grille-bars.



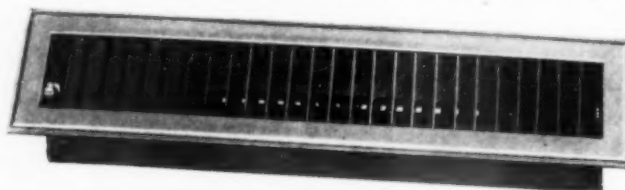
No. 190 MULTI-FLEX Commercial A-C Registers Streamlined for High Velocity Heating and Cooling

The easiest to operate of all high-velocity registers. Rolled-formed stream-lined grille-bars in both vertical and horizontal banks can be individually set to control air direction. Lever-operated rear valves control air volume.



NEW No. 1356 Side Wall Diffuser
Best Diffusion for Perimeter-Small Pipe Systems

When you want to use side wall registers on perimeter systems install this carefully engineered new No. 1356. It has the lowest resistance and best air distribution of all wall diffuser types — balanced at the register. Its neat design blends instead of clashes with all room surroundings.



No. 410 Diffuser Floor Register
Blankets Outside Walls and Windows

Throws air up and out — and slightly diverted away from drapes and walls to prevent discoloration — to provide a perfect blanket of warm air over cold window and wall surfaces. Grille-bars are set from 0° center graduating to 45° left and right. Set-screw feature permits adjusting volume and balancing system at the register.

As you end 1953 and plan for 1954, decide now to make it the "BEST WITH U. S.". Get latest prices on the Industry's Finest, Most Complete Lines of Registers and Grilles and Latest Developments in Process for Perimeter Heating.

Refer to Catalog No. 53 — or send for your copy — to see the complete line of U. S. Diffusers for Floor, Sidewall, and Out-of-Wall Installations.



UNITED STATES REGISTER COMPANY

BATTLE CREEK, MICHIGAN

MINNEAPOLIS • KANSAS CITY • ALBANY

SOLD BY LEADING JOBBERS FROM COAST TO COAST

3 profit-packed words

QUALITY...
COMPETITIVELY
PRICED

Here are the warm air furnaces dealers demanded... sized and designed for the new small homes... Williamson Quality and Priced Right! Pre-wired and pre-assembled packaged units, ready to install in 10 minutes, are so compact they're shipped in one large and one small crate.

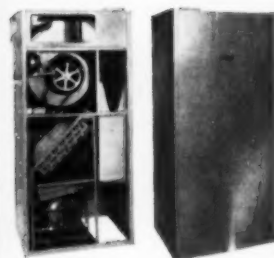
Specifically designed for 1" clearance on sides and rear, the entire furnace can be easily serviced from the front. Counterflow unit is only 22 1/4" wide, 18" deep and 72" high. Hi-Boy model is 22 1/4" wide, 27" deep and 65" high.

See 'em and be sold... see how easily they'll sell. For details, mail the coupon below today.



new,
project-type
furnaces,
easy to
sell and
install!

THE
WILLIAMSON
HEATER COMPANY



WILLIAMSON
Summer Air Conditioners

Williamson two and three ton companion summer air conditioners offer the dealer a double profit. The hermetically sealed compressor unit, warranted for five years, can be easily removed from the cabinet by one man. Write today for further information.

THE WILLIAMSON HEATER COMPANY
3529 Madison Road Cincinnati 9, Ohio

GENTLEMEN: Please send complete details on:

() New project-type furnaces () Companion air conditioners

name _____ title _____
firm _____
street _____
city _____ zone _____ state _____
signature _____

AN ELECTRONIC OUTDOOR THERMOSTAT CREATES IDEAL "INDOOR CLIMATE"

You'll impress more prospects with Electronic Moduflow . . . it gives more comfort by automatically boosting indoor temperatures as it gets colder outside



You'll make a vivid impression on your customers with a sales story on this wonderful new temperature control system—Honeywell Electronic Moduflow. They can appreciate the *even comfort* in all kinds of weather . . . whether it's cold or on mild days.

Moduflow provides constant comfort. It's the first control system to *vary* indoor temperatures . . . tests show that for more comfort, indoor temperatures should go up as the outside temperature drops. That's why you have *two* thermostats with Electronic Moduflow—one located outside and one inside the house.

Moduflow is easy to sell. As soon as prospects see how Electronic Moduflow uses an outdoor control to vary indoor temperatures according to weather changes, they're easy to sell. Moduflow is packed with all kinds of unusual, different features that can't be found on ordinary control systems.

Moduflow is easy to install. The new, simplified Electronic Moduflow system is easy to wire and calibrate.

Moduflow is easy to service. Because it's *electronic*, and has no moving parts, Moduflow is simple to service.

Moduflow is ideal for any home. Everyone is a prospect for Moduflow, provided he has an adequate heating plant. Thus there's no limit to prospects—and one Moduflow customer always leads you to another.

Get started now on Electronic Moduflow. Find out how easy it is to sell—and you'll see why it's one of the most outstanding profit opportunities in years!

Leading heating dealers say this about Honeywell Electronic Moduflow . . .

Roger Booth, Colorado Springs: "It's the greatest advance in home heating I've seen in years."






H. J. "Red" Brobst, Cleveland: "Moduflow is completely different from ordinary control systems."

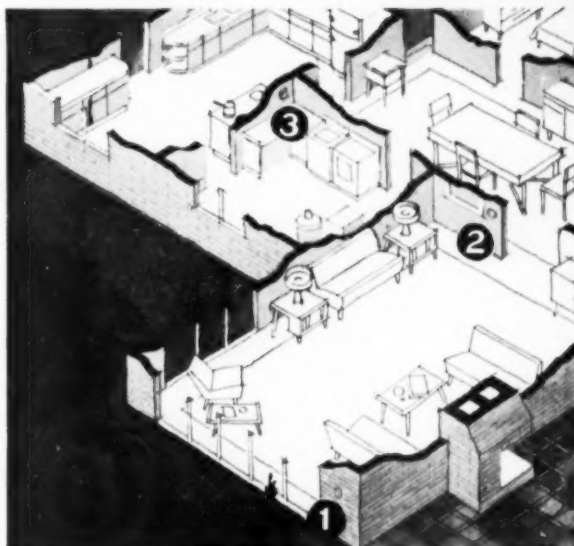


A strong national advertising program helps pre-sell your prospects. Your prospects are seeing interesting, hard-selling ads on Moduflow in national magazines, which make your selling job even easier. In addition, literature, display and other materials are available.

Here's how Electronic Moduflow works

The sketch (right) shows how Moduflow's three main electronic units work together to *vary* indoor temperatures automatically according to outdoor temperature changes.

1.  Electronic Weathercaster, outside, automatically raises or lowers control point of indoor thermostat when outdoor temperature changes.
2.  Electronic Clock Thermostat, inside, measures indoor requirements and sets percentage of burner "on" time needed to hold control point.
3.  Electronic Relay Amplifier receives these signals and then cycles the burner according to the percentage rate set by the indoor thermostat.

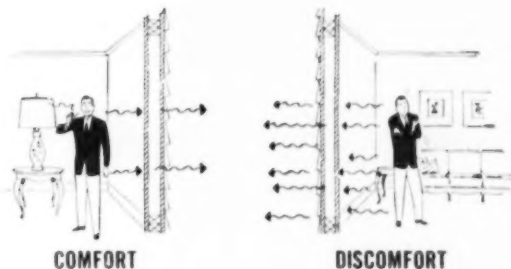


Moduflow provides more comfort by varying indoor temperatures



"Cold wall" problem solved by Moduflow

With chilly temperatures (top sketch), occupants feel comfortable when indoor temperature is 71°. But if the outside temperature drops (sketch immediately above), heat loss increases; so *higher* indoor temperature is needed to compensate for colder walls. Electronic Moduflow does this *automatically* by raising the control point of the indoor thermostat.



Why people need varying temperatures

Tests show if indoor temperature is merely held constant when outdoor temperature falls, a person inside *feels* uncomfortable. This happens because as walls become colder, they "draw" heat from the body.

MINNEAPOLIS Honeywell



Electronic Moduflow

Minneapolis-Honeywell Regulator Co.
Dept. AA-11-220
Minneapolis 8, Minnesota

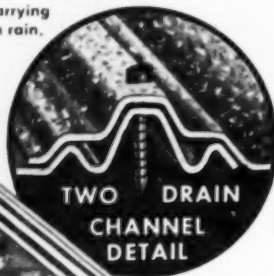
Gentlemen:
Please have your representative show me your "Dealer Profit" program for Electronic Moduflow.

Name

Address

City Zone State

"Two-Drain" feature is formed by side-lap of sheets. Note two channels for carrying off wind-driven rain.



MILCOR*

"TWO-DRAIN" ROOFING

gives you plenty to talk about!

When you go after farm roofing business—you get it!

It's easy for farmers to see why Milcor "Two-Drain" provides positive, water-tight protection for their barns and buildings. "Two Drain" has these specific features to point to — features that make sense to farmers:

- **EXCLUSIVE SIDE-LAP DESIGN** provides four barriers to water.
- **TWO CHANNELS** carry off wind-driven rain.
- **DOUBLE RIB BRACING** makes it easy to apply "Two-Drain" with only one row of nails.
- **EXCLUSIVE CHANNEL DESIGN** drains water off before it reaches nails.
- **FULL 24-INCH COVERAGE.**
- **MADE OF PRIME GALVANIZED STEEL** to assure long roof life.

All these are good reason, why farmers buy Milcor "Two-Drain" — and good reasons why you should push it.

See Milcor Catalog No. 500 for further description. If you don't have a copy, write for one today.

S-118A

*Reg. U. S. Pat. Off.

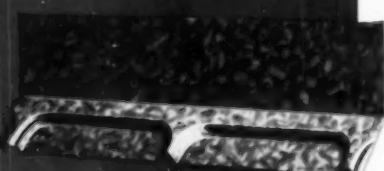
INLAND STEEL PRODUCTS COMPANY

1125 WEST BURNHAM STREET MILWAUKEE 11, WISCONSIN
 BIRMINGHAM 5, ALA. — 2200 Columbia Highway • CLEVELAND 1, OHIO — 4000 Ridge St. •
 CHICAGO 5, ILL. — 1501 S. Western Ave. • CINCINNATI 2, OHIO — 1000 Spring Grove Ave. •
 CLEVELAND 14, OHIO — 1001 E. 9th St. • DETROIT 2, MI. — 400 Woodward Ave. •
 KANSAS CITY 41, MO. — P. O. Box 714 • LOS ANGELES 24, CALIF. — 4001 S. 19th St.
 NEW YORK 1000 17, N. Y. — 220 Park Ave. • PHOENIX 10, ARIZ. — 4015 Clayton Ave.

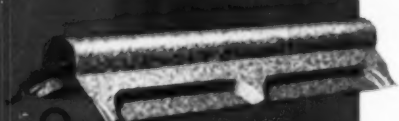
A complete line of accessories for finished appearance and weather-tight applications.



Finished roof joint



End wall flashing



Self-sealing ridge roll



2-inch No. 8 galvanized nail



Anchor strap nail

Form Sheet Metal Labor Adjustment Board

THE SHEET METAL Contractors National Association and the Sheet Metal Workers International Association have approved the establishment of a National Joint Adjustment Board whose function will be to settle disputes and controversies arising between parties to standard union agreements when such controversies cannot be settled at the local level. Following the approval of the plan by the two associations, a resolution was drafted detailing the types of disputes over which the board would have jurisdiction and outlining the procedure to be followed in handling cases submitted to it for settlement.

Final approval of plan details must be made by the SMWIA in its quadrennial convention in 1954. Meanwhile, the framework having been set up, NJAB becomes an instrument to be used where both parties voluntarily submit the dispute or controversy to it for settlement.

If approved by the international union, the NJAB procedure will become a part of the Standard Form of Union Agreement.

OHI Planning 1954 Exposition

OIL HEAT INSTITUTE will hold its 1954 exposition at the Commercial Museum, Philadelphia, May 16 to 20. The name of the exposition — National Indoor Comfort Exposition, Heating-Cooling — was chosen, according to M. J. Donahue, chairman, convention-exhibition committee, to point up the fact that this year's show will feature year 'round air conditioning, including cooling units as well as automatic oil fired heating equipment.

New Construction Tops 1952 Figure

EXPENDITURES totaling \$3.3 billion for new construction in September were 5 per cent above September 1952, according to preliminary estimates of the U. S. Labor Dept. Bureau of Labor Statistics and the Building Materials and Construction Div. of the U. S. Dept. of Commerce. Private construction alone accounted for the entire increase over 1952. For the first nine months of 1953, expenditures for all types of new construction amounted to \$25.9 billion — 7 per cent above the January-September 1952 total. Total expenditures for 1953 are expected to reach \$34.6 billion, exceeding the 1952 record by \$2 billion.

How SBA Will Aid Small Business

OUTLINING the plans and programs of the Small Business Administration, William D. Mitchell, administrator, recently pointed out that the primary needs of small business firms, which make up more than 90 per cent of all American businesses, are three: 1) Small business needs access to adequate sources of capital and credit on

reasonable terms; 2) small business needs greater opportunity to share in the growth of the American economy; 3) many small firms need managerial and technical consultation.

SBA, he said, has specific programs in each of these areas. "First, in the field of financial assistance, SBA is fostering the development of state-wide and local pools of private capital, in which banks and other financial institutions, business and civic leaders, and individual citizens can participate," Mr. Mitchell stated. SBA intends to use the funds provided by Congress for small business and disaster loans as a means of stimulating broader private financial assistance to small firms, through participation in loans with banks and other private lenders.

"Second," Mr. Mitchell continued, "SBA is developing plans for promoting a larger share of business, from public and private purchasers alike, for small firms. We are developing a program whereby new products and new methods of production will be opened up to small concerns for their own adoption.

"Third, SBA will stimulate the use of home talent and know-how to assist small firms with managerial and technical problems. For example, experts of various kinds in universities, colleges and in civic and business organizations can be helpful to small enterprise through cooperative endeavor," he said. Assistance will also be given to small firms in the areas of materials and equipment, subcontracting opportunities, certificates of competency, tax amortization, and in solving problems arising in the transition from defense to civilian production.

Mr. Mitchell concluded, "In short, the programs of SBA in all fields are designed to generate self-help and cooperation at the grass roots level."

Correspondence Course for Apprentices

HOME STUDY courses for apprentice training or for "brushing up" by finished sheet metal journeymen are now being offered at the American School, Chicago. The course was prepared under the supervision of Joseph J. Kaberlein, business representative of Sheet Metal Workers Union No. 73 and a sheet metal instructor at Washburne Trade School, Chicago. The course meets the requirements of Article 8 (c) of the National Apprenticeship and Training Standards for the Sheet Metal Industry. Information may be obtained by writing to The American School, 58th and Drexel, Chicago 37.

NHWA To Meet in Chicago

THE NATIONAL Heating Wholesalers Association plans to hold its annual convention December 7-9 at the Conrad

WHAT'S HAPPENING —

(Continued from preceding page)

Hilton Hotel, Chicago. Topics to be discussed at the December 2 business sessions include credit and collections, material warehousing, and pension and retirement insurance. Speakers scheduled for the Tuesday afternoon meetings are John C. Harkness, A. T. Kearney & Co.; Herman G. Seely, financial editor, Chicago Daily News; John Downs, managing director, Metropolitan Home Builders Association of Chicago; Edwin A. Scott, Jr., vice president, Sheet Metal Worker; and Wm. L. Dulle, vice president, E. E. Souther Iron Co. Credit insurance, how to establish a NHTA region, and who is responsible for freight claims (the manufacturer or wholesaler) will be discussed at the Wednesday business sessions. Following this will be a meeting, open to members and guests, devoted to federal trade practice rules. Dr. Theodore N. Beckman, Ohio State University, and Albert A. Carretta, Federal Trade Commission, will be the speakers.

Suggests Tool Replacement Program

SPEAKING at the fall meeting of the American Society of Mechanical Engineers, Carl M. Beach, vice president, Cincinnati Milling and Grinding Machines, Inc., said that a definite program for replacing machine tools and productive equipment is necessary to keep down costs. Emphasizing that such a program requires foresight and detailed analysis by management, he stated, "No live industry can keep pace with the advance of technology without continuous renewal and transformation of its productive facilities. Any equipment which does not meet the challenge of new and more modern machines must be displaced, regardless of its age or condition and whether it is physically worn out. A re-equipment policy that fails to give full recognition to obsolescence is bound to lead to abnormally high production costs and inefficiency. Because new equipment costs too much to discard existing facilities every time there is an advance in the arts, the installed capacity of industry necessarily lags, on the average, far behind the best that is currently available." The problem as he sees it is not to eliminate the lag, but to hold it to the lowest limits that are economically justifiable. Economic factors to consider in analyzing replacements include direct labor savings, indirect labor savings, depreciation and obsolescence, interest on money invested, and difference in maintenance costs between the new and old equipment, according to Mr. Beach.

How Should a Sales Tax Be Levied?

THE NATIONAL Chamber of Commerce recently recommended a national sales tax to the House Ways and Means Committee, outlining the advantages and disadvantages of levying such a tax at the point of manufacture or at the retail level. There is, of course, considerable difference of opinion as to the advisability of a general sales tax.

According to the Chamber, one advantage of a manufacturers' sales tax, levied on the end products of manufacturing, is that the tax would be easier to administer, since there are about 200,000 manufacturers as compared with a possible 2,000,000 retailers. Fewer government employees would be required to handle reports, so net revenue would be greater than a retail sales tax bringing in the same gross amount. A disadvantage of a manufacturers' sales tax is that the tax is pyramided, becoming an item of retail cost and thus influencing retail prices through mark-ups. As a result, the price to the consumer would be increased by substantially more than the amount of the tax. Since the retailer pays the tax before he sells his merchandise, the tax represents an increase in inventory investment, and thus increases inventory costs, insurance costs and the loss from mark-downs.

In listing the advantages of a retail sales tax, levied on the sale of an article to the ultimate consumer, the Chamber points to the fact that such a tax is not collected until the sale is made. Adverse effects on prices, such as pyramiding, are eliminated, says the Chamber. The tax does not have the inflationary effect that a manufacturers' sales tax has. The consumer does not pay more than the actual tax. Also, the tax is not hidden, and therefore conforms with the desirable policy of bringing taxes out into the open where they can be seen and recognized. Cited among the disadvantages of a retail sales tax is the fact that administration is more difficult. There are more retailers than manufacturers and more transactions to police. This, obviously, would increase the accounting burden and the cost of collection both to the government and the taxpayers.

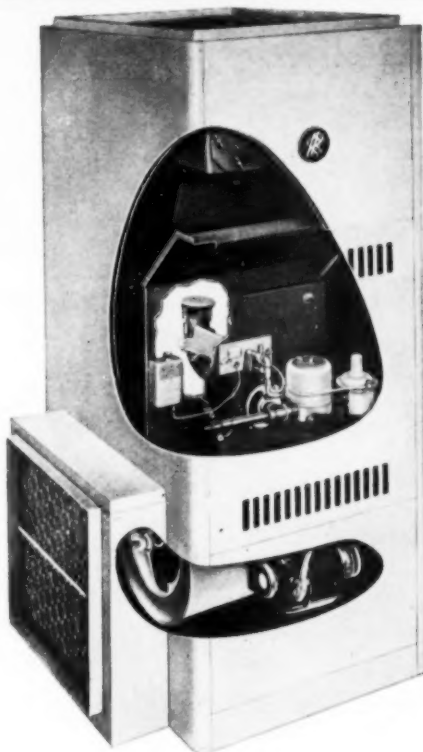
Pay for Fuel Over 12-Month Period

THE OIL HEAT Institute reports that the term *Heating Club* is being used in place of the old term, *Budget Plan*, which identified the fuel oil dealer's plan to spread the cost of winter fuel over a 12 month period instead of operating under a pay-as-you-go plan.

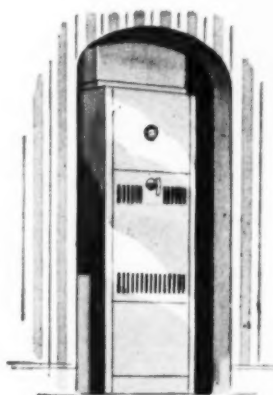
Open Market for Merchandisers

BENJAMIN F. FAIRLESS, chairman of United States Steel Corp., speaking recently before the Economic Club of Detroit, said that despite the fears of pessimists who are concerned about the absence of a backlog of consumer demand, the present state of the nation's economy indicates a sound market which business should strive to develop. "Today more people have jobs in America than ever before in our history — about 63½ million of them, in fact," he said. "They are also getting the highest wages in history. They are spending more money than ever before; and in spite of all they are spending, they still managed to save the fabulous sum of \$17 billion last year. The market is there, and the money is there, and all in the world we have to do is go out and get it."

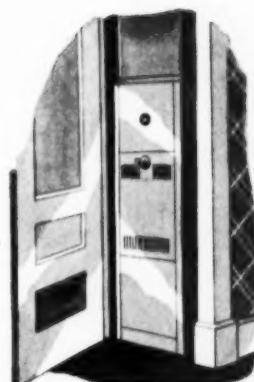
SU-30-G
85,000 BTU
input per hour



SU-35-G
110,000 BTU
input per hour



AGA Approved!
**for alcove and
closet installation**



Gas-fired **RICHMOND** winter air conditioner

Where space is tight, use the Richmond SU-G, gas-fired, vertical winter air conditioner... ideal for the small ranch-type installation.

Now the SU-G is approved by the AGA for alcove and closet installation. When ordered for this type of installation our standard unit is especially adapted to meet the rigid AGA requirements. When ordering the Richmond SU-G for closet or alcove use, be sure to state that fact.

Remember that the SU-G can be furnished with a bottom filter rack as optional equipment at no extra charge. And remember these special features: Remote pilot igniter (standard equipment) for convenience and safety in lighting burner from outside of furnace...burner and controls quickly and easily removable as mounting plate is held securely in place with four nuts. When space and economy count...count on the Richmond SU-G.



RICHMOND

RICHMOND RADIATOR CO.—AFFILIATE OF REYNOLDS METALS CO.

See your wholesaler or Mr. Carson Today

Richmond Radiator Company AA-11
Box 111, Metuchen, New Jersey
Please send me full information on Richmond SU-G
gas-fired winter air conditioners.

Name.....

Company.....

Address.....

small in actual size



BIG

in job-time savings

Ever stop to think what a sizable percentage of your time on the job is spent in "putting things together"? When you do, you'll agree there's a big opportunity to save by choosing fasteners of proved reliability.

You can avoid trouble by specifying *Parker-Kalon* whenever you order Sheet Metal Screws. Every screw in every box is guaranteed first quality. Also, every screw is now identified*, so that you can be sure you are getting genuine Parker-Kalon Screws, even when screws are removed from the box.

Write for samples. You'll see why top-rated sheet metal men everywhere say "If it's P-K, it's O.K."
Parker-Kalon Corporation, 200 Varick St., New York 14.



PARKER-KALON®

The Original

SELF-TAPPING SCREWS

Sold through
Industrial
Distributors,
the Supply
Specialists
that serve you



GET THIS GUIDE TO TROUBLE-FREE FASTENING

Tells you "where to use what" type of screw in all types of sheet metal, including stainless steel. Gives complete information on hole sizes and application data for all types of fastenings. Ask your P-K Distributor, or write Parker-Kalon for Form No. 480.

*This mark  on every P-K Self-tapping Screw identifies it as genuine.

NIAGARA

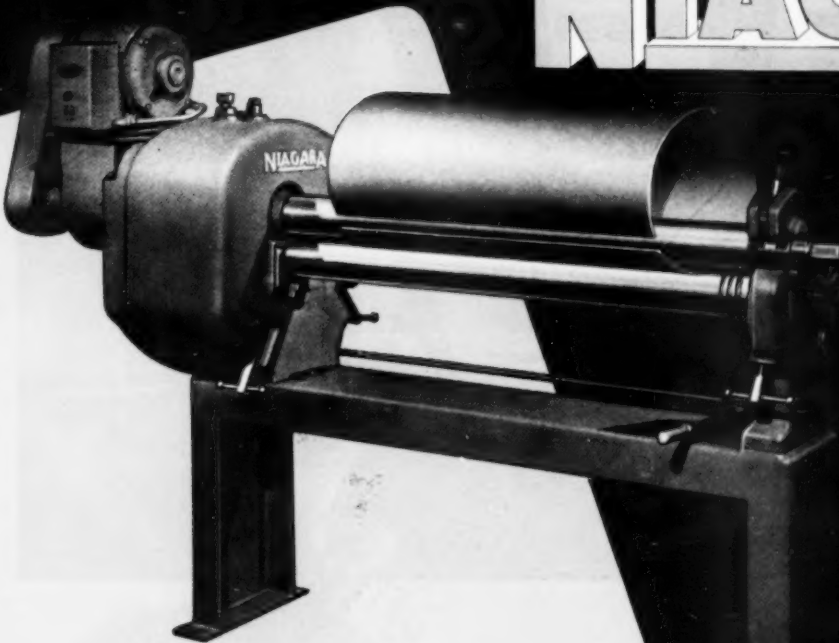
SLIP ROLL FORMER

features

FINGER TIP
RELEASE

UPPER ROLL
SWINGS FORWARD

NO LIFTING



4" x 48" Slip Roll Former with V-Belt motor drive, reversing clutch and welded steel floor stand.

- ★ Instant trigger release speeds production
- ★ Sleeve bearing carried on roll, whether open or closed, maintains proper bearing conditions
- ★ Welded steel base
- ★ All 3 rolls gear driven
- ★ All gears machine cut and totally enclosed
- ★ Hand and power operated models
- ★ Gears and clutch in power unit operate in bath of oil
- ★ Positive, quick acting reversing clutch standard on powered models

Other slip roll formers are made in sizes ranging from 1" x 16", hand-operated bench mounted models to 7½" x 120" power driven machines.

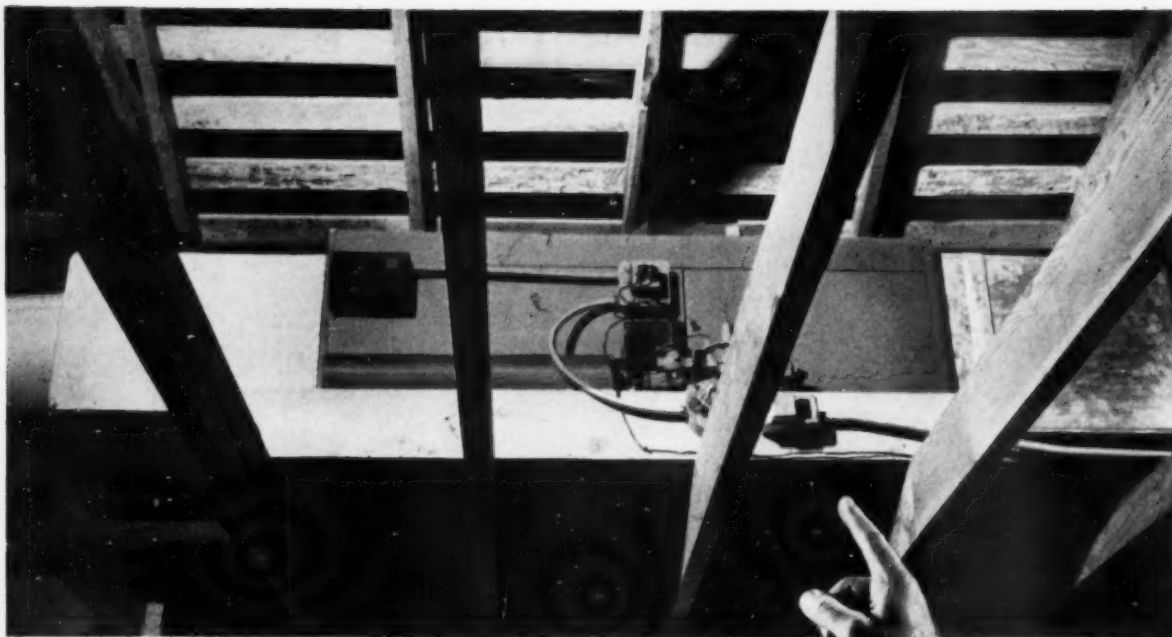


ASK YOUR NIAGARA DEALER FOR NEW BULLETIN 77

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

*Manufacturers of America's Most Complete Line of Presses, Shears, Machines and Tools
for Plate and Sheet Metal Work*

DISTRICT OFFICES: DETROIT • CLEVELAND • NEW YORK



"10 to 1 it's a SEQUOIA"

It's no surprise to Sequoia's nation-wide dealer group to find space-conscious home builders using more and more horizontal type gas furnaces these days. They've been earning good profits on horizontal sales for several years!

Sequoia engineers were among the industry's first to see the need for a big performance central forced air unit that left costly floor square footage untouched. Thousands have been built, sold and installed. And today's Sequoia line is the industry's most complete selection of horizontals.

"10 to 1..." possibly is a bit high, nationally speaking. But it is true that you see lots of Sequoia *Horizontals* going in new residential and light commercial jobs every day.

The reasons why are important to any dealer planning now to add a line of horizontals. First, Sequoia *Horizontals* are proved performers — the pioneer line known and used everywhere. Second, Sequoia gives you all five important sizes, 70,000 to 150,000 btu. Third, the Sequoia name assures quality at competitive price. What else is there?

Literature on Sequoia Horizontal, Closet'eer and Rev-flo gas furnaces — or dealership data — may be obtained from any sales office.

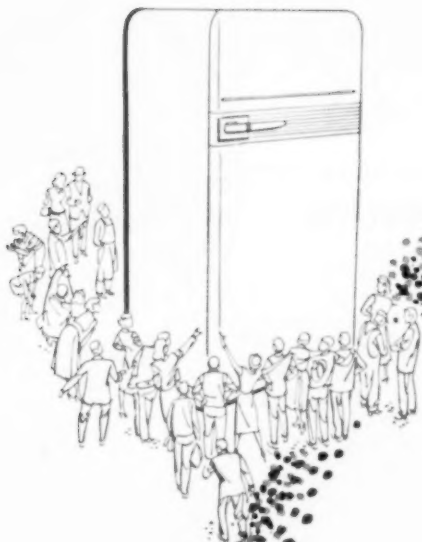
RICHMOND, VA. Jack Muther, 1504 Belleville St.
BIRMINGHAM, ALA. W. M. Dunbar & Co., 1720 Second Ave.
NEW ORLEANS. John A. Davis, 1016 Chappelle St.
ST. LOUIS. J. R. Layton, 1374 Louisville Ave.
KANSAS CITY, MO. Patterson Co., 4112 Pennsylvania Ave.
OKLAHOMA CITY. Guy W. Gentry, Box 7131
DALLAS. Jack B. Earp, 1023 Galloway
PASADENA, CALIF. Glenn A. Barnes, 15 N. Oakland

Sales Department

SEQUOIA MANUFACTURING CO.

1000 Brittan Avenue • San Carlos 5, California

Stocks maintained in Richmond, Va.; Birmingham, Ala.; and Los Angeles, Calif.



lonesome part of a popular product

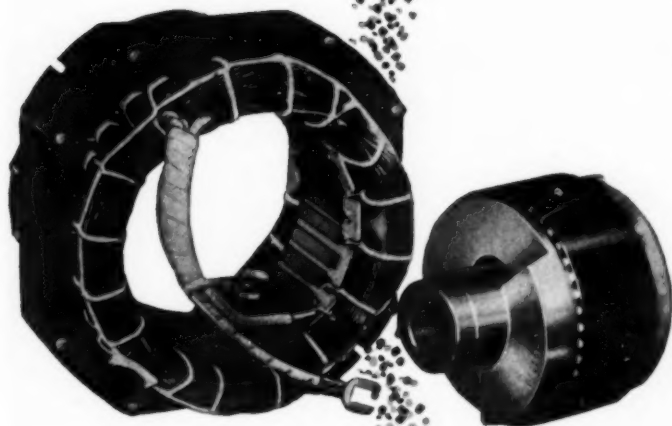
The hermetic motor—that part of a modern refrigerating unit the user *never* sees—is truly "out of sight . . . out of mind."

And the fact that it is forgotten is a tribute to its design and construction, for here is a motor that must always function perfectly, while permanently enclosed in the compressor housing. *The "forgotten" part of many of America's most dependable refrigeration units is an Emerson-Electric Hermetic Motor.*

You can benefit from Emerson-Electric's 63 years of experience in motor design and production. If you have requirements in ratings from 1/20 to 5 h.p., or hermetic motors from 1/8 to 20 h.p., Emerson-Electric has the right motor for you. Your inquiry is invited.

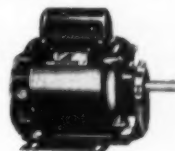
THE EMERSON ELECTRIC MFG., CO.

St. Louis 21, Mo.



EMERSON-ELECTRIC MOTORS

**For Belted Fans
and Blowers**



These motors incorporate all the electrical and mechanical specifications best suited for this service. Split-phase motors, available in 1/8, 1/4 and 1/2 h.p., with resilient mountings and automatic reset thermal protectors. For complete data write for Motor Bulletin No. 455.

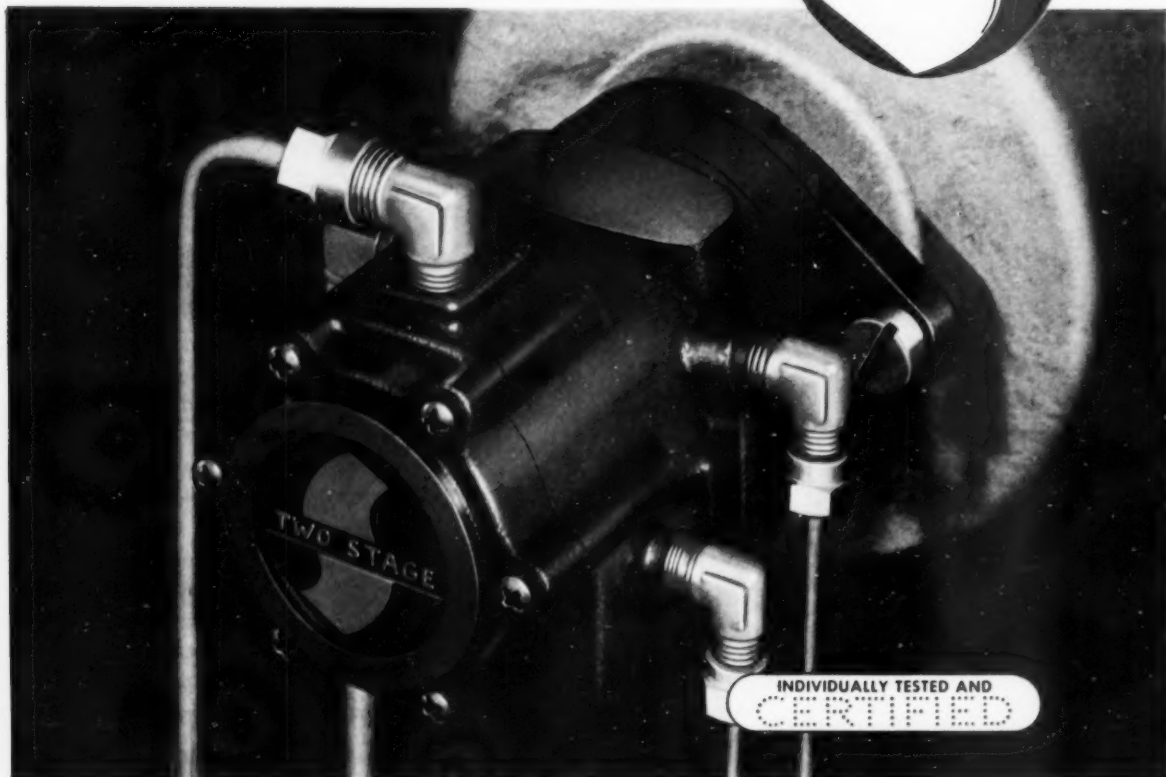
EMERSON
MOTORS • FANS



ELECTRIC
APPLIANCES

New!... Air-Oil Fuel Unit

for low-capacity heating



Sundstrand's latest contribution to better oil heat is this remarkable new low-pressure, air-oil fuel unit designed for firing rates from .4 to 1.5 gph. Intended to supplement Sundstrand's present line of high-pressure fuel units, this new low-pressure model is ideal for today's compact, modern housing. It gives you a unit that will handle the entire firing range (.4 to 1.5 gph) with only one large orifice nozzle... and unusually clean starts and stops. These advantages plus easy installation and service

are brought to you in an amazingly small unit, which measures only 7" long by 3" in diameter and weighs just 7 pounds. It has air, lift and metering pumps, cutoff valve and strainer all designed for years of satisfying heating service. For more information, write for Bulletin 1107.

NOTE: Burners must be designed specifically to use this new fuel unit. Except on manufacturers' recommendations, the unit should not be installed in the field for conversion of high-pressure to low-pressure type systems.

HIGH-PRESSURE UNITS

MODEL "J" SINGLE STAGE...

MODEL "H" TWO STAGE

For 3, 6, 10, 14 and 20 gph firing rates... Strainer capacities—6, 10, 15, 20 gph... Solenoid Valves optional on factory assemblies only... interchangeable with earlier models.

SUNDSTRAND MACHINE TOOL CO.
Hydraulic Division, Rockford, Illinois

SUNDSTRAND

A name to remember in **FUEL UNITS**



Washington Letter

Predict '54 a Good Year — Rising Costs a Challenge

THE OUTLOOK for a big 1954 for the sheet metal, warm air heating and air conditioning field is most optimistic, if forecasts issued by economists here may be taken at approximate face value (and it's likely that they can be).

Congressional economists, in a confidential staff report to the joint congressional committee on the economic report, have stated that high levels of production and employment should continue well into 1954.

"Not caution, but analysis of the facts, drives us . . . to the seemingly dull and unexciting conclusion that, economically, the possibilities for the next two or three years are likely to be either in the direction of stability or slight rises such as have prevailed for the last two years, or, at the worst, something of a rather mild and selective decline," it was stated.

The report noted that the 5 per cent drop in gross farm income is "disquieting," but said economists agree it isn't likely to cause a general depression.

If a recession were to set in, the congressional economists indicated they are all in favor of having the government act promptly. They suggest such corrective actions as:

1. A shift in monetary policy in the direction of easier credit through open market operations or reduced reserve requirements
2. Repeal of "business-dampening" wartime excise taxes
3. Easing of budget restrictions on long-postponed federal, state and municipal construction
4. Specific relief policies for areas of chronic or unusual distress

The signs of strong economic activity are here now, and secondary signs indicate that there is bound to be intense economic activity next year.

Housing construction will pass the million mark again this year, and that's a lot of houses.

Personal income remains very high, by all past standards, and people give every evidence of having confidence in their own personal economic future. The Federal Reserve Board, in its latest survey of consumer income, has found that the net worth of consumers is around \$4100 — some \$500 to \$1000 higher than it was in 1950. FRB found that most consumers owned assets far in excess of their debts, with almost half of the 54 million "spending units" (families) having a net worth of \$5000 or more.

The number of households in the U. S. is increasing now at the rate of 950,000 a year, according to the U. S. Bureau of the Census. The total number now in existence is about 46,828,000, statistics released here indicate.

Government spending (federal, state and local) is not likely to be less in the next year than in this year. If anything, the government will spend more — in various ways — on public construction next year than was true in 1953.

In view of these factors, it's difficult to forecast any kind of a recession.

Cost Rises a Challenge to Business

ON THE OTHER HAND, it's generally agreed among observers here — economic and political — that cost rises will continue. This means an increase in the number of businesses that will go under because of various factors which have more effect under high cost conditions — lack of efficiency, failure to keep pace with new methods, inadequate capitalization, illnesses or other contingencies, and poor management policies generally.

Cost increases stem, in the main, from higher wage rates, higher fuel costs (gasoline and utilities such as electricity, fuel oil and natural gas), creeping rentals and local taxes, and higher interest rates on borrowed money.

None of the cost rises, by itself, could cause a healthy business to sink. But all of them, put together, represent quite a load for any business to carry.

Sheet metal and warm air heating management will be challenged to do a better managerial job at every step of the way in '54, as competition stiffens and as consumers look around for a little better price.

Bankruptcies and sales of businesses on the ragged edge are increasing, and will increase in '54. But it won't be due to the lack of high economic activity. It will be due to the fact that this kind of an economy demands more efficiency — from the top man on down — than a lot of companies are prepared to give.

How CPA's Help Heating, Sheet Metal Shops

INTENDED AS an aid to increased efficiency is a new 14 page booklet published here by the Small Business Administration. Entitled, *Public Accounting Services for*

WASHINGTON LETTER—

Small Manufacturers, it is the fifth in the series on management of small business. The contents are applicable to the management of a sheet metal or warm air heating business. The booklet can be ordered, for 15 cents, from the U. S. Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Because accounting techniques are intricate and exacting, they are among the more important, least understood and most often misused management skills, the booklet points out. In addition to the normal auditing services, the booklet explains how public accountants can help small businessmen with problems in keeping adequate records, developing meaningful financial statements, estimating capital requirements, cost accounting, budgeting, inventory control, sales and credit policies and tax return preparation and tax planning.

Other pamphlets in the small business management series, all available from the U. S. Superintendent of Documents, are:

An Employee Suggestion System for the Small Plant, 15 cents; One Hundred and Fifty Questions for a Prospective Manufacturer, 20 cents; Human Relations in Small Industry, 25 cents; and Improving Materials Handling in Small Plants, 20 cents.

Tax Cuts Improbable

CONGRESS, SLATED TO begin its second session on January 3, will meet against a backdrop of increased international tension accentuated by the widespread realization that Soviet Russia has the capacity to deliver mighty H-bomb blows against the nation.

This ominous background, plus the fact that it will be an election year, makes it improbable that Congress will ruthlessly cut the federal budget, or make any great policy changes in any direction.

The scheduled tax cuts—individual, corporate and excess profits—will take place on January 1, as the administration has made clear. But any other tax cuts, overall, are not likely to get much of a hearing on Capitol Hill.

If there are excise tax cuts (on specific articles that have been subjected to excises since World War II), such cuts will be coupled with a broad manufacturers' excise tax, covering virtually everything except food items.

The fact that the administration will seek such a broad manufacturers' excise is common knowledge in Washington. It explains why some 200 reporters smiled (a lot of them laughed out loud) when President Eisenhower told them he would not ask for a retail sales tax.

A manufacturers' excise tax, when and if it comes, will mean higher costs to those in the sheet metal and warm air heating field. Those costs will have to be passed on to customers, of course.

Although it may not find much support on Capitol Hill, the administration will seek to push through amendments to the Taft-Hartley act in the forthcoming Congress session. The action will be designed to woo labor leaders into the fold, if possible.

It also will sponsor changes in the social security law, both to broaden coverage and to increase benefits. What changes, if any, are made in the social security law will cost business more—either in higher social security taxes, or, eventually, in higher income taxes.

Appreciably higher sums will be sought for civil defense purposes at home by the administration. Instead of tens of millions, some legislators are talking in terms of a billion dollars or more to prepare the nation for the worst eventuality—an H-bomb attack—just in case.

Incidentally, your representative and your senators are at home now or will be, either in your district or in the state, between now and Christmas. If you feel strongly about any phase of national policy, and can see your congressmen personally, do not fail to do so. A personal friendly visit, during which you can present your views in an open, careful manner, may mean more to your representative or senator than a dozen telegrams or letters next spring.

SBA to Grant Only "Essential" Loans

DON'T GET YOUR HOPES up that you can very easily get a loan from the newly-organized Small Business Administration, which has replaced the Small Defense Plants Administration and has taken over the lending functions of the Reconstruction Finance Corp.

William D. Mitchell, SBA Administrator, has announced here that the agency will give preference on all loans to companies which are contributing directly to production necessary to military, defense and essential civilian requirements. This will hold true for the current fiscal year at least. The applicant must also prove that he cannot get a loan from a bank because of legal bank restrictions. These restrictions apply though the banks may have no question as to the character of the applicant or of his ability to repay. Provisions are also made for SBA to participate with banks in making loans.

The agency has adopted a policy of charging 6 per cent on direct loans and "not less than 5 per cent" on participation loans with banks.

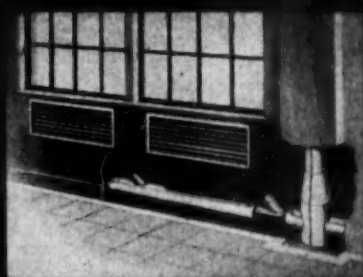
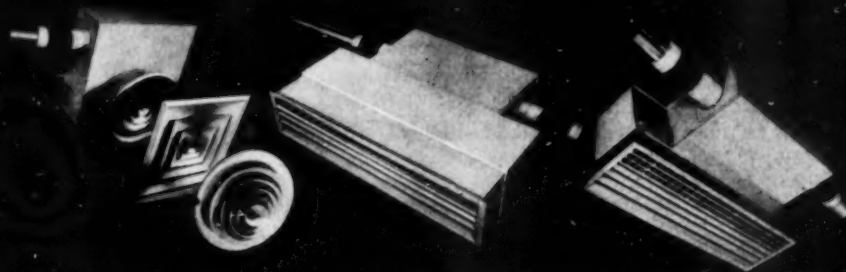
New Patents Available for Use

OVER 200 patents recently have been made available for free, unrestricted use by the public through dedication by the Westinghouse Electric Corp., the Patent Office, U. S. Department of Commerce, has announced. These patents may be used by anyone without obtaining licenses or paying royalties.

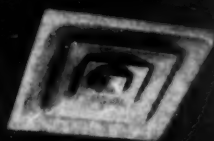
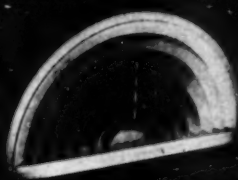
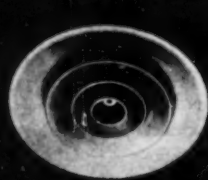
The majority of these patents relate generally to the

No matter *which*
air conditioning system you use...

HIGH VELOCITY



OR CONVENTIONAL



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are in sight
the installation
is right*

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DRAFTLESS Aspirating AIR DIFFUSERS

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10 EAST 39th STREET, NEW YORK 16, N. Y.

REPRESENTATIVES IN PRINCIPAL CITIES

"No Air Conditioning System Is Better Than Its Air Distribution"

field of electronics. On the list are patents relating to an electric hand drill, an electric fan, electric furnaces, a high tension electrical measuring instrument, and resilient motor mountings.

Lists of the patents, as well as a pamphlet listing 609 patents previously dedicated to the public for free, unrestricted use, may be obtained without charge from the Patent Register, U. S. Patent Office, Washington 25, D. C.

Agency to Coordinate Business Information

ESTABLISHMENT OF the new Business and Defense Services Administration, U. S. Dept. of Commerce, has been announced here by Secretary of Commerce Sinclair Weeks, who called it "a new consolidated agency, developed for modern conditions and geared for practical programs of teamwork between government and business in serving the best interests of all the people through an organized exchange of timely ideas, information and services."

The new agency (a) continues the residual defense and mobilization functions of the old National Production Authority, as authorized by law; (b) consolidates five current departmental offices; (c) establishes 25 industry divisions, staffed by business experts from government and private industry, and (d) provides a focal point for

effective cooperation between government and business in promoting economic stability and growth.

The offices transferred to the new agency are the office of technical services, the office of distribution, the field service, staff functions of the industry evaluation board, and the office of industry and commerce, including its trade association, commodities standards and area development divisions.

"In addition to its functions in the area of defense production and planning, it is primarily an agency designed to serve business, to promote the expansion of employment opportunities, and in many ways to stimulate economic growth and stability—thus benefitting savers, managers, workers, consumers and the general public," Mr. Weeks pointed out.

"It will be a listening post and sounding board for bringing business information and business opinion on vital matters relating to government and industry, including reports on business conditions, to the direct attention of the Commerce Dept. for appropriate action. One phase of all this is greater cooperation between the department and industry groups and trade associations."

Charles E. Honeywell, a business executive of California and Hawaii, has been appointed administrator of the new agency. H. B. McCoy, a career Commerce official, is deputy administrator.

The three assistant administrators will be H. J. Wallace,



YOUR BEST MOVE... SELL *Payne*

THE GREATEST NAME IN HEATING

1. Priced right to sell — in tracts, projects, or mansions.
2. Complete new furnace line.
3. Highest profit.
4. Guaranteed quality.
5. Built for easiest installation.
6. Designed for easiest service.
7. Outstanding advertising and sales promotion to back up your selling efforts.

Only PAYNE has the new lifetime JETGLAS HEART! JETGLAS — the heart that never fails — was developed from the miracle coating which protects jet fighter engines subject to operating temperatures above 1500° Fahrenheit. The heating element of Payne furnaces, with this miracle JETGLAS protection, is the buy of a lifetime!

CAN'T BURN OUT! CAN'T RUST OUT! CAN'T WEAR OUT!

PAYNE offers a complete new 1953 line of gravity and forced air designs for closet, attic, floor, wall, basement or crawl space installation. For descriptive literature — for the name of your local distributor — write PAYNE FURNACE • MONROVIA, CALIFORNIA

A DIVISION OF AFFILIATED GAS EQUIPMENT, INCORPORATED, MONROVIA, CALIFORNIA; CLEVELAND, OHIO; TYLER, TEXAS; INDIANAPOLIS, INDIANA

WHEN QUALITY AND PRICE MUST GET TOGETHER

THE ANSWER

IS UTILITY



**4-WAY DISCHARGE
SINGLE INLET • SINGLE WIDTH**



SERIES ELEVEN



VENT SET

The best that money can buy can cost you less! The world's most advanced production methods help keep the cost of Utility blowers and parts at competitive levels. Utility's policy of finest materials, engineering and quality control enables you to meet the highest specifications on any job.

Here is a combination that can't be beat.

If you're not planning on Utility blower equipment for your heating and ventilating installations, you may be risking a lost contract.

You'll be "right on the job" when you work with Utility. Write us today for full information. *Our facilities are yours.*

Tested and rated in accordance with A.S.H.V.E. and N.A.F.M. codes.

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A DIVISION OF UTILITY APPLIANCE CORP.

MANUFACTURERS OF HEAVY AND STANDARD DUTY BLOWERS FOR HEATING, AIR CONDITIONING AND VENTILATING INSTALLATIONS. PRODUCERS OF BLOWERS AND BLOWER PARTS FOR ORIGINAL EQUIPMENT MANUFACTURERS.

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METALBESTOS
the job
is right!



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the insulated vent**

assures permanently safe and efficient venting because it is designed solely for use with gas appliances. The latest and most comprehensive venting research yet undertaken proves conclusively that only a properly designed vent pipe will safely and completely remove **all** the products of combustion. It demonstrates the importance of such factors as heat loss through the vent, the location and size of vents and the material from which they are made.

**METALBESTOS IS DESIGNED SPECIFICALLY
FOR VENTING GAS APPLIANCES**

- insulated, double-wall construction
- inner hot stack carries off vent gases without condensation
- cooler outer pipe protects adjacent walls
- made of corrosion resistant aluminum, won't break or crack, lasts the lifetime of the house.

METALBESTOS INSTALLS EASILY AND SECURELY

- pipe sections automatically aligned by special couplers
- joints tightly sealed, won't pull apart
- adjustable fittings for fast, exact installation

Write for free VENT INSTALLATION HANDBOOK



Contains complete, up-to-date information on gas appliance venting and many helpful installation tips. Based on latest authoritative venting research. For your copy write to Dept. B-14498



METALBESTOS DIVISION
WILLIAM WALLACE COMPANY • BELMONT, CALIF.

WASHINGTON LETTER —

on leave from the National Tube Div., U. S. Steel Corp.; Walter A. Edwards, on leave from Owens-Illinois Glass Co.; and Perrin G. March III, on leave from Cincinnati Shaper Co. William E. Haines, who has had wide experience in both industry and government, will be the assistant deputy administrator.

There will be three staff offices, handling technical services, small business and distribution.

Nickel "Set Free" for Civilian Market

NO SOONER had Secretary Weeks set up the Business and Defense Services Administration than did he direct it to revoke its controls over the distribution of nickel and its use in the civilian economy, effective November 1.

BDSA followed this in a few days by revoking the entire order M-80, except for columbium and tantalum, which had been in effect since August 15, 1951. This revocation removed all restrictions on the use of nickel, nickel silver, and nickel-bearing stainless steel, and relieves industry of the necessity of filing forms NPAF-60, 102, 113, and 114.

"Decontrol of nickel will be a boon to thousands of small business firms, especially fabricators and electroplaters," Secretary Weeks said here. "For two years, small businessmen have registered justifiable complaints that government restrictions on nickel were causing them to lose business, with resultant hardship to themselves, employees and customers."

He pointed out that defense and stockpile needs have been assured, and that from now on producers of a wide variety of items can use, without restriction, "the metal that they purchase in a free market for making whatever goods they expect the public to buy."

Nickel is the last of the major metals to be "set free" as far as the civilian market is concerned.

Bidding on Government Contracts

THE SMALL BUSINESS ADMINISTRATION has released here another leaflet in its management aids series, entitled Sound Pricing Policy in Bidding on Government Contracts, which may be obtained free either by writing to the SBA, Washington 25, D. C., or from any of SBA's field offices.

To meet the rigid government requirements in bidding on government contracts, the leaflet points out, small business firms must take stock of all their facilities to assure themselves that they can produce "in the black."

The leaflet points up 10 "pricing pitfalls" of which the small business must be wary in bidding for government contracts. It points out that to develop sound prices for government business, the small businessman should pay particular attention to allowable costs, specifications, productive capacity, subcontracting, materials, labor, record keeping and similar items.

— LARSTON D. FARRAR

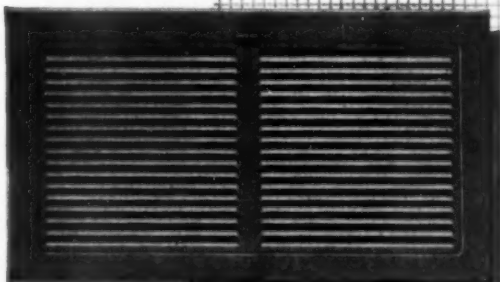
Auer fills all your Register needs FROM ONE RELIABLE SOURCE

Why not take advantage of the time-saving convenience of filling all your register needs from the complete dependable line made by The Auer Register Co.? Here are registers and grilles for all purposes—gravity or air conditioning.

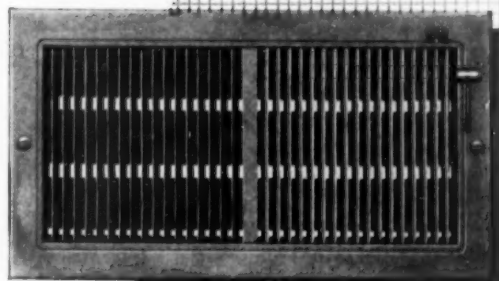
Auer REGISTERS QUALITY CONTROLLED PRODUCTION

When you install Auer registers, you have the assurance of accurate dimensions and uniform high quality—the result of Auer's system of strict quality control of production.

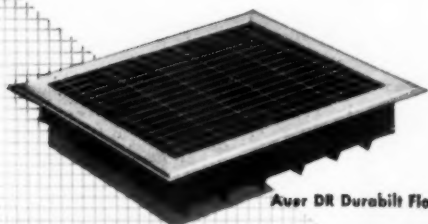
Write for the 30-page Auer Register Book for complete information.



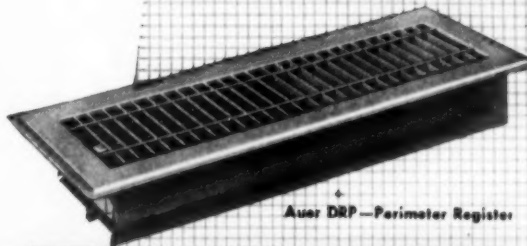
Auer No. 7032 Register with flexible fins and single valve



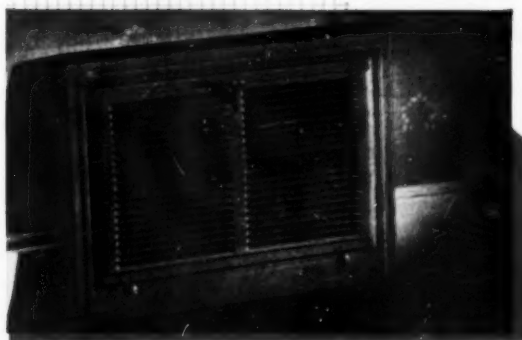
Auer No. 4432 Register with flexible fins and multi-lever valve.



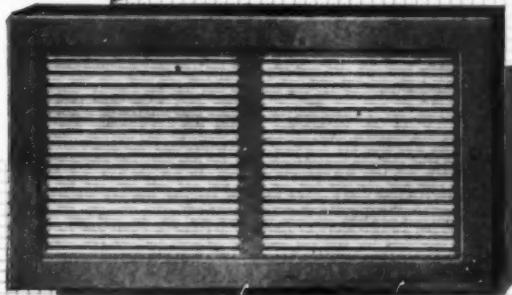
Auer DR Durabilt Floor Register



Auer DRP—Perimeter Register



Auer H-800 Heat Rite Baseboard Register

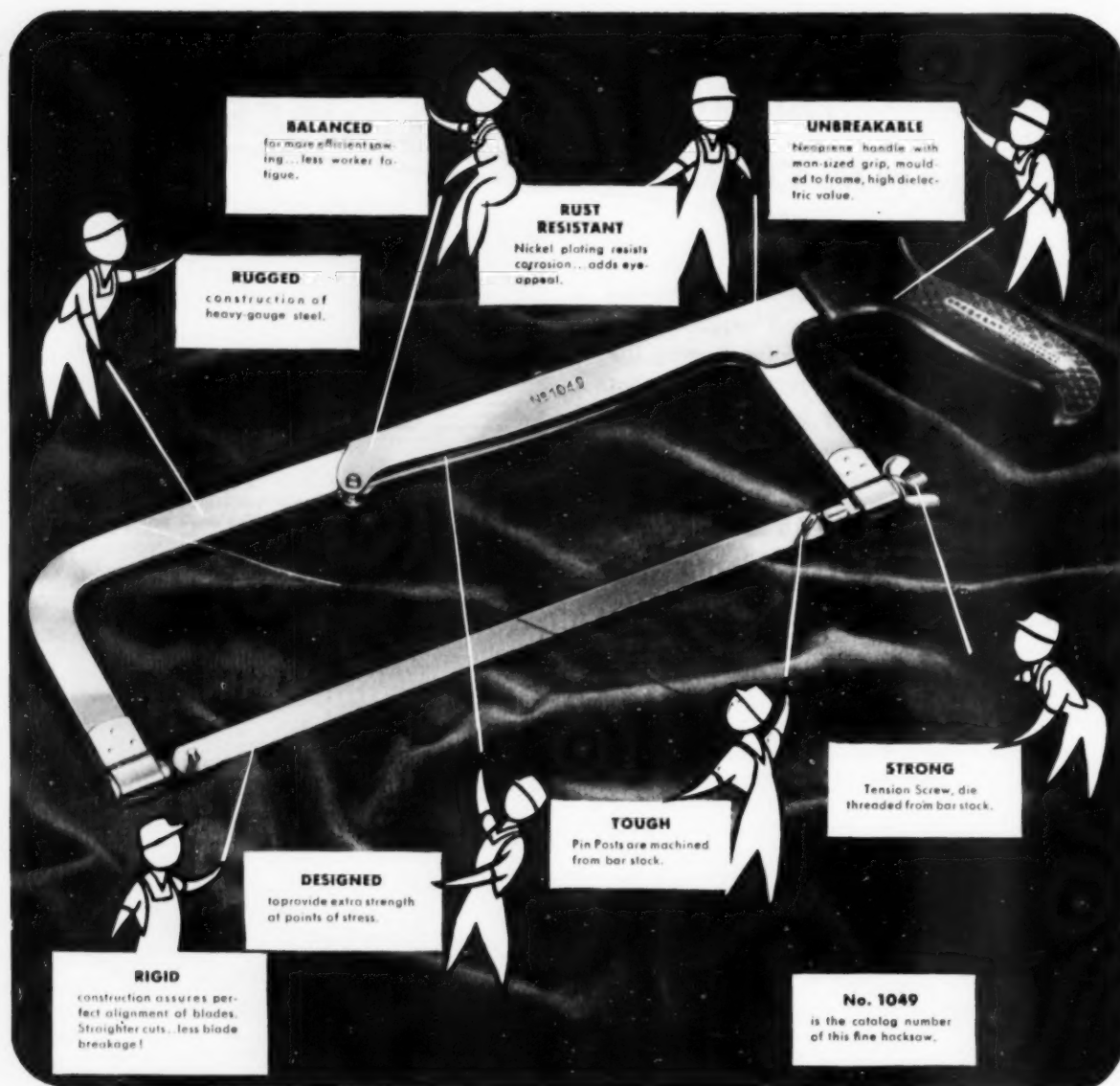


Auer No. 7043 Baseboard Intake

Auer
REGISTERS
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THE AUER REGISTER CO. 6600 CLEMENT AVE. • CLEVELAND 5, OHIO

Canadian Distributor—Marchand Furnace Ltd., Tilbury, Ont.



These eight features make Crescent's No. 1049 A BETTER HACKSAW

● In addition to its structural superiority, this fine Crescent Hacksaw has a neoprene handle... comfortable and resilient to grip... practically indestructible... impervious to oil, acids, extreme heat or cold. Sold by Hardware Dealers everywhere.



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Give Wings to Work

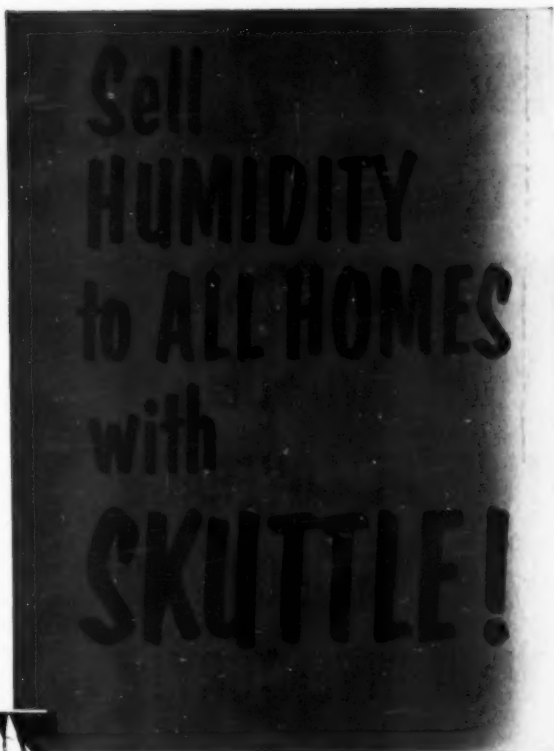
*Sign of the Artisan
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CRESCENT TOOL COMPANY, JAMESTOWN, NEW YORK

There's a SKUTTLE HUMIDIFIER for **ANY** kind of heat

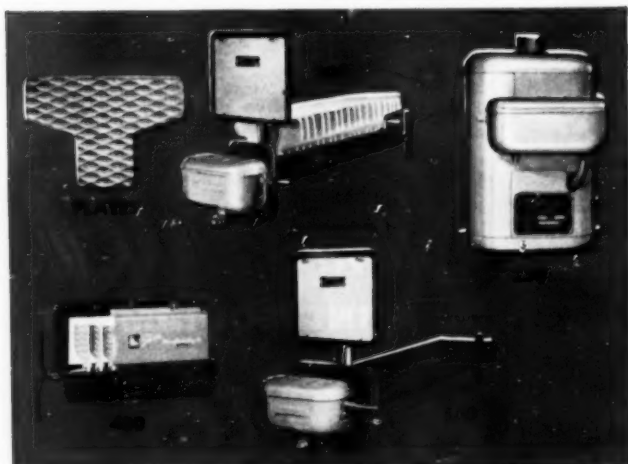
If you handle the Skuttle line, you don't have to pass up the profit of humidifier sales in **any** home. The Skuttle line is complete. There's a Skuttle Humidifier for any type heat—Winter Air Conditioning—Gravity Warm Air—Counterflow—Low Highboy—Highboy—Floor Furnace—Space Heater . . . Steam, Hot Water or Vapor.

See the complete line below. Each is an efficient, durable, satisfactory unit that you can recommend with confidence.



Skuttle Series 600

The most popular humidifier for many years. For all standard type automatic fired warm air furnaces, including gravity and winter air conditioning. Easily installed. Self-flushing—self-cleaning. Patented Vapoglas plates for efficient evaporation. Blown glass float—can't leak. Chrome and nickel plated valve parts—aluminum plate rack to eliminate electronic corrosion. Double coated acid and alkali resisting porcelain enamel pan and float chamber.



Skuttle Model 450

For warm air furnaces where space doesn't permit a Series 600. Model 450 can be used if there is 3" space between furnace and casing—counterflow—floor and other furnaces and space heaters.

Skuttle Model 250—Gas Fired

Independently gas fired for steam, hot water and perimeter heated homes.

Skuttle Series 300 for Large Homes

Holds up to 35 Vapoglas plates—for large homes.

Skuttle Series 500 for Coal Fired Warm Air Heat

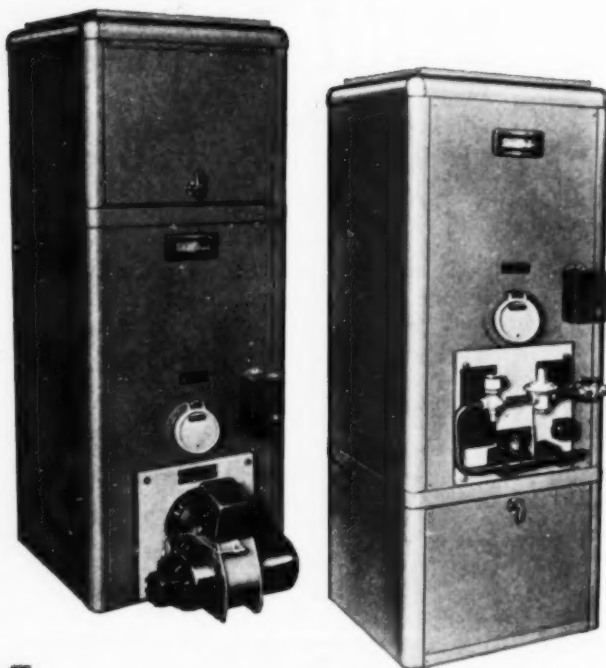
Needs no plates—for use in high temperature plenums.

Patented Vapoglas Evaporating Plates

Pure glass wool compressed under heat. The most efficient plate you can get. All evaporating plates should be replaced when clogged with water chemicals—about once a year.



**YOU CAN DOUBLE
YOUR TWO-FUEL
MARKET COVERAGE
WITHOUT INCREASING
YOUR INVENTORY!**



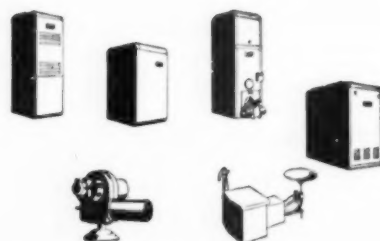
Silent Automatic

OPTIONAL OIL-OR-GAS FURNACES

Because Silent Automatic Optional Furnaces can be fired with oil or gas, you get twice the sales value—twice the market coverage—from every furnace! That's right—you stock one furnace, install either oil or gas burner and controls when the customer decides which fuel he'll burn. What's more, these hi-furnaces can be assembled as counter-flo furnaces merely by mounting the blower section at the top. This Silent Automatic flexibility cuts down your inventory problem—saves sales!

The complete new line of Silent Automatic furnaces, boilers and conversion burners has a great deal to offer heating men on the lookout for a line they can move in volume. It's competitively priced. Its name has meant quality heating to millions for nearly 30 years. Most units come factory-assembled. There are models and sizes for every heating situation.

Write R. E. Loebell—Timken Silent Automatic Division—for information on this great new line. Do it soon! It may well be one of the finest profit opportunities of your lifetime.





*"One good reason we sell burners with
WEBSTER Fuel-units and Ignition Transformers
is this—they save service calls.*

*"And our customers like them
for the same reason."*

• • •

• Avoid unnecessary service on the burners you sell.
See that they are equipped with WEBSTER Fuel-units
and Ignition Transformers. Write us today for literature.



WEBSTER  **ELECTRIC**
RACINE WISCONSIN

"Where Quality is a Responsibility and Fair Dealing an Obligation"
WEBSTER ELECTRIC COMPANY, RACINE, WISCONSIN • EST. 1909

NIAGARA UNITS

Simplify

**Year-Round Air Conditioning
Installations for Homes ANYWHERE**

*Warm Air
Furnaces . . .
Refrigerated-Air
Home Coolers*

With Niagara's extensive lines of gas, oil and coal furnaces and electric cooling units you can ideally meet the requirements for year-round air conditioning in **any** home — **anywhere**. By combining a Niagara home-cooling unit with any Niagara forced air furnace you provide the home owner with circulating warm air in the winter and circu-

lating cool, dehumidified air in the summer. This is the most simple, most economical, most effective way of providing **year-round** air conditioning.

To meet air conditioning requirements for any home, Niagara gives you:

For Homes with Basements • GAS-FIRED FURNACES • For Homes without Basements



Series 50 AC
CAST IRON



Series 40 AC
STEEL

Niagara Series 50 furnaces are equipped with the exclusive Niagara cast-iron heat exchanger, famous for dependable long-time operation with low gas bills. Deluxe Series 50 AC models have 3-speed direct-drive blower — standard models, single-speed, belt-drive blower. Also available in gravity models. Sizes range from 75,000 to 180,000 BTU input. Niagara Series 40 furnaces have exclusive Niagara-made alloy steel heat exchangers. Blower-filter unit of AC models may be installed on either side (shown above at left side of heating unit). Also available in gravity models. Sizes from 60,000 to 140,000 BTU input.



Series 40 DFAC
Down-Flow



Series 40 VAC
Hi-Boy

The series 40 line of high-boy winter air conditioners includes down-flow types for perimeter heating systems, and conventional up-flow units. Exclusive Niagara-made alloy steel heat exchanger. Sizes from 50,000 to 115,000 BTU input.



Model
60-75 DFAC



Model
60-75 VAC

OIL-GAS CONVERTIBLE: For Homes with or without Basements

Designed for the economical use of oil, Niagara Series 60 convertible furnaces are exceptionally compact and can easily be converted to gas when desired — with a Niagara gas conversion burner. Equipped with exclusive Niagara-made steel heat exchanger of new, space-saving, rectangular design. Line includes vertical down-flow and up-flow complete winter air conditioners.

The blower-filter unit of 60 AC models may be installed on either side. Gravity models also available.

Series 30 furnaces are complete winter air conditioners of the basement or "low-boy" type. Deluxe models have 3-speed direct-drive blowers; standard, single-speed, belt-drive. Sizes from 105,000 to 210,000 BTU.



Model 60-75 AC



Series 30 AC

Coal-Fired Furnaces

Efficient, durable cast-iron Niagara coal furnaces are available in three styles: Square cabinet and round casing gravity furnaces, and rectangular forced-air furnaces.



Coal-Fired
Forced-Air



Coal-Fired
Gravity

. . . and Summer Air Conditioning in its Most Effective, Economical Form

Niagara refrigerated-air Home-Cooling Units make the supreme comforts of year-round air conditioning practical and economical in all homes that are heated by forced-air systems. The units are designed to use the blower, filter and ductwork of the heating system for the distribution of cooled air in the summer. Units of 2-ton and 3-ton capacity occupy less than 6 sq. ft. of floor space.

Write for the complete Niagara story — the outstanding money-making and prestige-building lines for heating contractors.



Niagara Cooler
NC-2

THE NIAGARA FURNACE DIVISION
THE FOREST CITY FOUNDRIES COMPANY
2500 West 27th St. • Cleveland 13, Ohio

HOME-HEATING EQUIPMENT MANUFACTURERS SINCE 1890

Old Man Winter is at the door!



take a good look at your heating system... now!

Remember last winter? Well... there's no good reason for you and your family to suffer through another uncomfortable heating season of being too hot, then too cold.

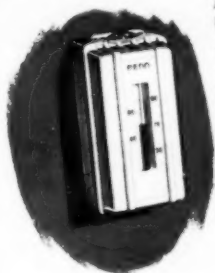
Here's all you do. See your heating dealer now... ask him to show you how a *modern* automatic heating system controlled by the *modern* PENN

heat-anticipating room thermostat definitely stops Hot-n-Cold living.

The PENN thermostat is no ordinary thermostat. It not only "feels" the changes in room temperature but *senses them in advance*. This amazingly accurate thermostat with its PENN-made magic of "heat anticipation" keeps room temperature within 1° regardless of outside weather conditions. And that's *real heating comfort for you and your family!*

Whether you buy a new heating plant or moderate your old one, *invest* on PENN Controls... they cost no more but give *much more* in comfortable living.

Penn Controls, Inc.
Goshen, Indiana.



COMFORT
around
the clock



For greater comfort, convenience and fuel economy, also get the PENN TempClock. It lowers the temperature at bedtime so you can enjoy the restful sleep of a cooler home. Then, in the morning *before you arise*, TempClock brings temperature back to daytime level. And it's all done *automatically!*

PENN

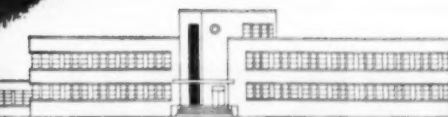
AUTOMATIC CONTROLS

Selected by leading manufacturers for over 30 years
FOR HEATING, REFRIGERATION, AIR-CONDITIONING, PUMPS, AIR COMPRESSORS, ENGINES, GAS APPLIANCES

THIS YEAR... OVER 30,000,000
MESSAGES WILL HELP YOU SELL

Nationally Advertised In
Better Homes & Gardens
American Home
Newsweek

PENN



AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, GAS APPLIANCES, PUMPS, AIR COMPRESSORS, ENGINES

IT STARTS
**buying
action**

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Now... *before* the winter rush... is when you want your heating prospects to modernize their heating systems. These Penn Control ads help you get 'em going. They direct your heating prospects to see you *now* for more comfortable living this winter... they *pre-sell* your prospects on automatic heating with Penn's heat-anticipating thermostat and Penn heating controls... they make your heating sales job easier.

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Need metal-working machinery or tools? Again you can deal with the same convenient source. Your nearby Ryerson plant supplies every type used by sheet metal shops.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT
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Let "Native Talent" Work for You

WE CALLED recently on a warm air heating dealer who is widely known for the aggressive and enthusiastic selling activities of his employees. This reputation has not been built upon the activities of one department alone, but is reflected in the installers, service men, shop men, warehouse and business office staff as well as the sales force. When asked to what this enthusiasm could be attributed, he said, "Give your co-workers an incentive and responsibility and you will be surprised at the ideas they come up with that will smooth out the handling of everyday events."

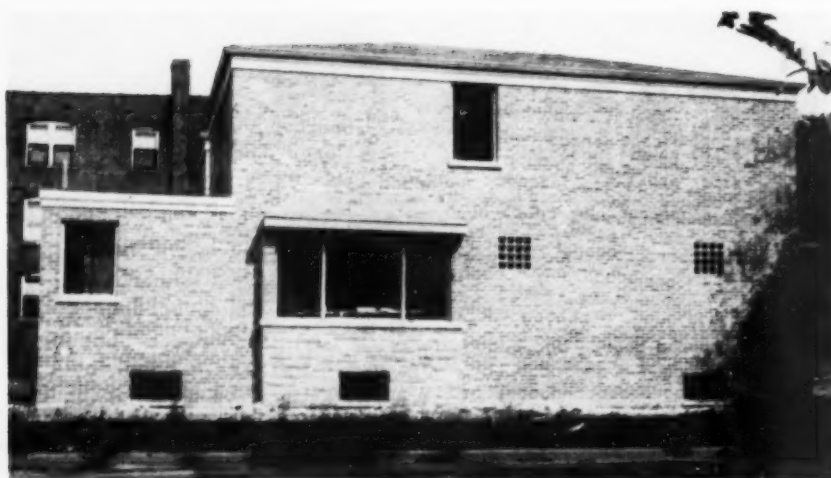
This philosophy has paid off in many businesses of all sizes, from huge manufacturing firms that offer cash rewards for ideas that help the corporation to turn out more products at lower costs, to the small sheet metal shop where a good craftsman who shows his willingness to cut wasted time is awarded with greater responsibility and more opportunity to participate in the business.

It is not always the incentive of cash rewards that will cause an employee to figure out a better way to perform an operation — many times it is the recognition and praise from the supervisor that makes the employee feel he has contributed something to "his" company and that he has the ability to do other than the job he was assigned. This unmeasurable attitude has been responsible for the success of many young business organizations in the face of competition from well established firms.

What is this thing that is so hard to define, yet can mean outstanding success when used — and when not used, can spell discontent and even failure? It might be classified under the heading of "understanding human nature," which in itself is a difficult subject to define. Most people classify themselves as "average" and sell themselves short on their abilities. They tend to minimize the positive and to accentuate the negative. They count up their liabilities and forget their assets, and wind up following the path of least resistance.

The trick is to take an "average" man and show him that almost all successful people were only "average" but that they recognized this fact and worked hard to improve their position. He, too, can climb above his current position — and, incidentally, his present income bracket — by studying his job carefully and planning each time he repeats the operation to improve his efficiency. This is incentive at work. The recognition of achievement is a valuable tool for every businessman to learn to use to his advantage.

The warm air heating dealer we mentioned earlier said, "When a problem develops, don't try to work it out by yourself. Take it to your fellow workers, present it to them, ask them to think it over and let you know how they would handle it. You'll be surprised to learn how much 'native talent' you have working for you."



1 TO SELECT HEATING and cooling equipment for this two story brick home, follow these 10 steps:

10 STEPS IN SIZING COOLING SYSTEM

- 1** Determine outside design temperatures for geographical location of home.
- 2** Establish inside design temperatures.
- 3** Establish time of day at which maximum load will occur.
- 4** Establish which parts of the house are to be heated and cooled.
- 5** Calculate net wall, window, ceiling, and floor areas for each room, identifying the compass direction of each.
- 6** For each type of exposed construction, calculate or select from tables of pre-calculated values overall heat transfer coefficients (U values).
- 7** Determine temperature differentials between the conditioned and unconditioned side of each exposed surface.
- 8** Multiply exposed areas by U values and by temperature differentials to obtain heat flow rates in Btu per hr.
- 9** Total Btu rates in each room. Add miscellaneous heat (cooling load only). This gives requirements per room.
- 10** Total room loads and add outside air load. This gives house requirements.

Year 'Round Conditioning for a Two Story Home

By S. W. Reid

**Air Conditioning Engineer
Gilbert Associates, Inc.**

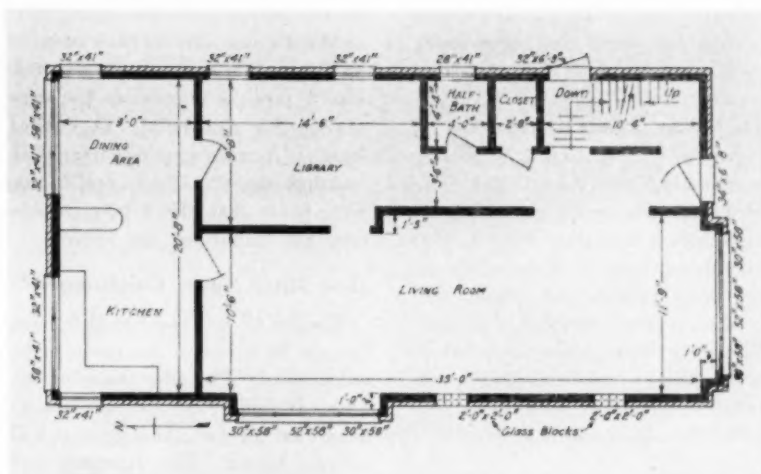
The author follows through a step by step procedure for estimating the heating and cooling requirements of the home, and shows why a 3 hp unit will do a good cooling job in this example

THIS SERIES of articles so far has been devoted to a discussion of the basic principles of residential air conditioning. The next several articles will cover the application of

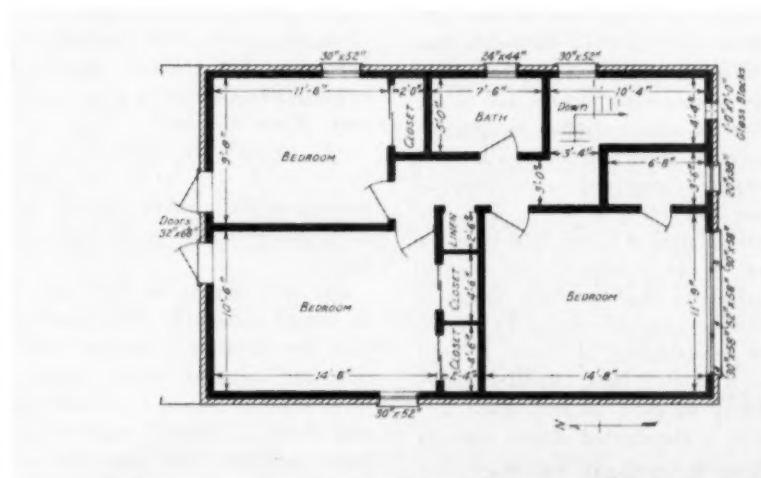
those principles to actual homes. The procedure for planning a year 'round system of warm air heating and summer cooling will be reviewed.

The first home to be considered is

two story brick with full basement, as shown in Fig. 1. The building is located in the Chicago area and is designed for an urban neighborhood where building space is limited. Figs.



2 IT WAS NECESSARY to calculate specific areas (net wall, window, ceiling, etc.) for each room on the first floor . . .



3 THE SECOND FLOOR, and other parts of the house which were to be conditioned

2 and 3 show the first and second floor plans of the home. Ceiling height is 8 ft. Notice that the kitchen-dining area in the rear is directly under a roof. The building faces south, and since it is on a corner lot, the large exposed west wall (foreground, Fig. 1) has no prospects of shading except by trees which do not yet exist.

The first step in planning the heating and cooling system is to establish the respective heating and cooling loads. There are many types of forms available to simplify the mechanics of this procedure. The dealer, for instance, may already be familiar with Manual 3 as published by the National Warm Air Heating and Air

Conditioning Association (NWAHA-CA) for calculating residential heat losses. This association has recently published a tentative edition of Manual 11 for calculating heat gains in a residence. (A sample problem, using Manual 11, was published in American Artisan, August, 1953). Most of the values in these and other short forms are based on values published in the American Society of Heating and Ventilating Engineers' Guide. In spite of their common origin, however, certain values are subject to considerable interpretation on the part of those drawing up and those using the forms. The result is that no two forms and no two estimators will show exactly the same load

Air Conditioning Fundamentals

This is the 14th in a planned series of articles devoted to the fundamentals of air conditioning systems for summer and winter, and providing specific information on all the component parts. Special emphasis is placed on how to adapt cooling to warm air heating systems.

Articles So Far:

1. The terms used in the air conditioning field, i.e., air properties, comfort conditions, etc. (September, 1952 issue)
2. The parts of the refrigeration system and how they work (October, 1952 issue)
3. How to estimate cooling loads (November, 1952 issue)
4. How to achieve proper air stream patterns in the conditioned space (December, 1952 issue)
5. Duct design — comparison between sizing for summer and winter (January, 1953 issue)
6. Condensing units (February issue)
7. Fans, fan motors and fan speeds (March issue)
8. Filters—throwaway, cleanable, electronic (April issue)
9. Condensers and water regulating valves (May issue)
10. Cooling towers and evaporative condensers (June issue)
11. Equipment selection (July issue)
12. Electrical control systems (August issue)
13. Electric controls (September issue)
14. Sample problem — estimating cooling load and selecting equipment (this issue)

Future Articles:

1. Second sample problem, using different building and conditions
2. Trouble shooting — detecting malfunctioning of summer air conditioning equipment (two articles)
3. Replacement procedures for defective parts in cooling equipment (two articles)

for a given building. Anyone interested enough to take the time to calculate the load on a given building using several of the many different forms may be confused by the variation in results.

This is not too serious, however, for the objective of the load calculation is to determine equipment size, and the magnitude of the variation will usually be small enough so as not to influence the choice of equipment. In cases where it could, however, the actual choice will usually be tempered by the experience of the man making the estimate and possibly by the man buying the equipment. By and large it can be stated that the industry has been quite successful in matching loads with equipment, in spite of some inconsistencies between load determination methods. It is recommended that the dealer select one method, become familiar with it, and stick to it. Experience will indicate any adjustments that may be necessary.

Design Temperatures

Turning now to the problem at hand, let us follow through with the procedure for estimating the heating and cooling requirements for the home shown in Fig. 1. Interested readers will find the ASHVE Guide a useful reference for obtaining most of the information needed. Dealers will find Guide material reproduced in many manufacturers' reference sheets. In order to proceed systematically, we shall follow the steps listed under Fig. 1.

The first and second steps are usually a matter of common practice for a given area. The Guide lists -10°F winter and 95°F dry bulb, 75°F wet bulb summer outside design temperatures for the Chicago area. Inside design temperatures usually used are 70°F winter and 80°F dry bulb, 67°F wet bulb summer. It should be remembered that design temperatures are not intended to be anything but reference points in calculating heating and cooling loads. It is intended that the heating load will indicate the equipment needed to maintain at least 70°F inside when it is -10°F outside.

Likewise, the cooling load is intended to show how much equipment capacity is needed to hold the inside temperature to 80°F when it is 95°F outside. When outside temperatures are above -10°F or below 95°F , the conditioning equipment will have adequate capacity to maintain any reasonable temperature desired. It is possible to assume other inside design temperatures, but those indicated have been established as providing the most economical equipment selections consistent with a reasonable amount of comfort at extreme outside conditions.

When Is Maximum Load?

The third step applies primarily to the cooling load calculation, as it requires an estimate of the time of day at which the maximum load will occur. The time element enters the cooling load picture due to the effect of solar radiation on exposed surfaces. Heat flow through a structure is proportional to the temperature differential across it. The normal differential would exist when the sun is not shining or the exposed surface is shaded. Solar radiation increases the differential by raising the temperature of those surfaces upon which it falls. Radiant energy falling on glass or thin wood surfaces is transmitted almost instantly to inside spaces. In contrast to this, radiant energy falling on walls and roofs is delayed in its effect on the cooling load because of the heat absorbing characteristics of these parts of the structure.

Inspection of the house shows that the largest exposed walls are east and west. It cannot be expected that the maximum load will occur on the house in the morning when the sun is shining on the east wall, since the outside temperature will be well below maximum. In addition, a neighboring house to the east will provide shade to partially reduce the load on the east wall. The south wall is relatively small, so that its contribution to the load from solar energy will only supplement the major load which comes when the sun is shining on the west wall. Radiation on the west wall will not have its

greatest effect upon the cooling load until sometime after its peak intensity on the outside surface. For this reason 4 p.m. is chosen as the time of day for calculating the cooling load. (Actual supplementary calculations made at 2 p.m. and 6 p.m. were lower than the 4 p.m. calculation and confirmed the choice).

How Much Space Conditioned?

The fourth step requires that some thought be given to the space to be conditioned. The attic space of the house is unfinished and too low in headroom for use. Therefore, it will not be heated. The remainder of the house will be heated, including the basement, which has possibilities of being used as a recreation room.

For cooling, it was decided to include the entire house except the basement. The basement load will be small when the space is not occupied. When it is used, cool air that would normally be supplied to the house proper can be diverted temporarily to the basement through the ducts that will have to be there for heating.

The fifth step is the first one in the actual calculation. The structure part identification, compass direction, and net area should be tabulated for the exposed surfaces of each room. Exposed surfaces are those adjacent to unconditioned spaces or the outside. It is not necessary to use dimensions measured to the nearest fraction of an inch. They can be rounded off to the nearest quarter foot without appreciable error. As each area is tabulated it is well to note special information which may affect heat flow through it. Storm windows or awnings, for instance, should be noted where used. Where walls normally expected to be sunlit are shaded by trees or adjacent buildings, a note should be jotted down so that these special conditions will be taken into account in calculating heat flow.

Selecting U Values

The sixth step is probably the most difficult as it may involve considerable judgment on the part of the estimator which can be acquired only

through experience. This step requires the selection of heat transfer coefficients (U values) for the various parts of the structure.

As a matter of review, it should be recalled that heat flow is calculated by multiplying together three factors. Thus:

$$H = AU (T_o - T_i)$$

Where:

H is heat gain or loss, Btu per hr
 A is net area of exposed surface, sq ft
 U is heat transfer coefficient, Btu per hr per sq ft per deg F
 $(T_o - T_i)$ is outside temp. minus inside temp., deg F

The value of U may be obtained in one of two ways: either from tables of precalculated values for certain common types of construction or by calculation using basic data on materials used in the construction. Most of the information required may be found in the Guide, Manual 11, or other industry publications.

Fig. 4 identifies the various structure parts and shows the U values used in the calculations. These values were obtained by both methods indicated above. The U value for the walls was calculated as follows:

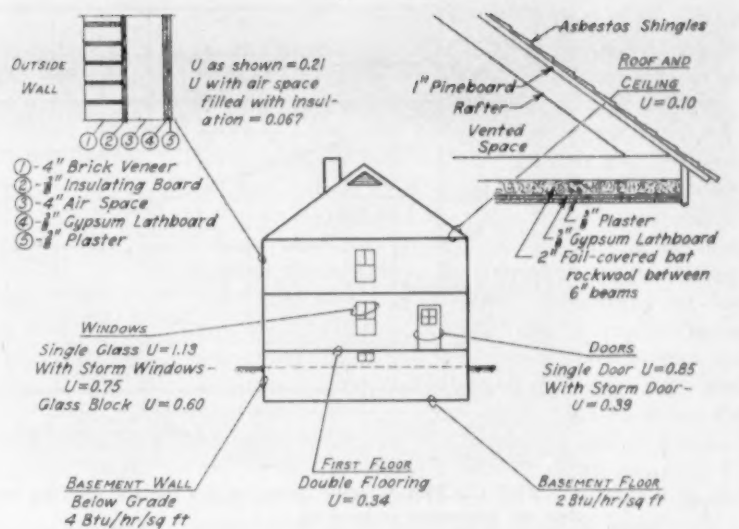
$$U = 1/(1/C_1 + 1/C_2 + 1/C_3 \dots)$$

where C_1, C_2, C_3 , etc., represent heat flow values in Btu per hr per sq ft per deg F for each component of the wall. Thus:

Component	C	$1/C$
Outside		
air film	6.00	0.17
4 in. brick veneer	2.27	0.44
$\frac{3}{4}$ in. insulating board	0.44	2.27
4 in. air space	1.10	0.91
$\frac{3}{8}$ in. gypsum lath board	3.73	0.27
$\frac{3}{8}$ in. plaster	8.80	0.11
Inside		
air film	1.65	0.61
		$1/U = 4.78$

$$U = 0.21 \text{ Btu/hr/sq ft/deg F}$$

It should be again mentioned that the load is calculated at 4 p.m. The flat ceiling over the kitchen-dining area has a U value of 0.14. For the alternate cooling load, wall insulation and west awnings are assumed; for the alternate heating load, wall insulation, storm windows and storm doors are assumed.



4 AN IMPORTANT STEP in selecting equipment was the calculation of overall heat transfer coefficients (U values) for each type of exposed construction in the home

Temperature Differentials

The seventh step involves the third factor in the heat transfer equation — the temperature differential between the conditioned and unconditioned side of each exposed surface. For the heating load calculation, this is simply a matter of the inside dry bulb temperature minus the outside dry bulb temperature $[70 \text{ F} - (-10 \text{ F}) = 80 \text{ F}]$. This value was used in the heat transfer equation for all surfaces except the below-grade parts of the basement wall.

Temperature differential values used in the cooling load computation are not quite so simple. The basic temperature difference of 15 F $(95 \text{ F} - 80 \text{ F})$ of course applies to all surfaces not exposed to solar radiation. For those surfaces in the sunlight, artificial temperature differentials have been set up so that if these are used in the heat transfer equation, the computed heat flow will be equivalent to the actual flow caused by the combined effects of the 15 F air temperature difference and the radiant heat from the sun. These empirical temperature differential values have been worked out for glass, wall, and roof surfaces, the latter two having been corrected for

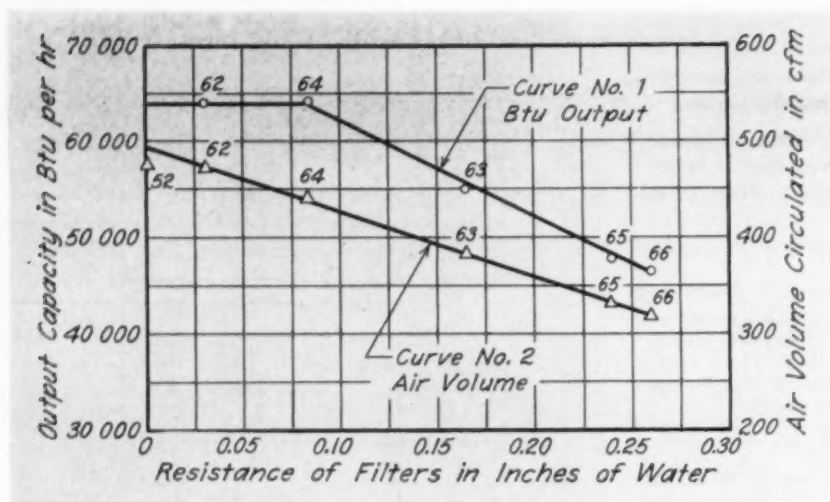
the transmission time lag and absorption characteristics of various types of construction. Values used for glass in the sample house were corrected for inside venetian blinds, which it was assumed will be used.

The completion of the first seven steps should produce a series of tabulations such as the one for the dining-kitchen area shown in Table 1. Steps 8 and 9 require, respectively, multiplication of the three factors to obtain Btu per hr values and addition of the latter to get room heat gain or loss totals. The cooling load for certain rooms should include heat given off by people and heat producing appliances if these two heat sources are considered to be of any consequence. For the sample house, it was estimated that three people will be in the living room at the time of maximum load. Accordingly, 200 Btu per hr was added to the living room load for each of the three persons. No appliance load is anticipated.

Outside Air a Factor

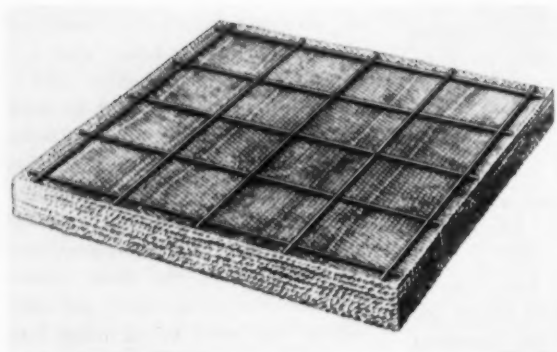
Outside air is a factor in both the heating and cooling load calculations. One way to estimate the amount coming into a house is the rather familiar crack method used

(Please turn to page 97)

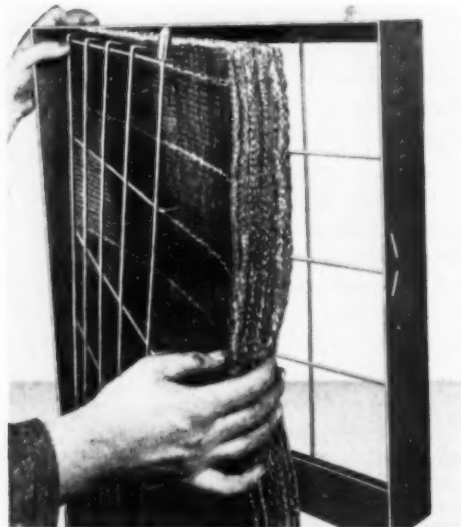


1 THE DECREASE in the output of this furnace, resulting from clogged air filters, makes clear the importance of knowing . . .

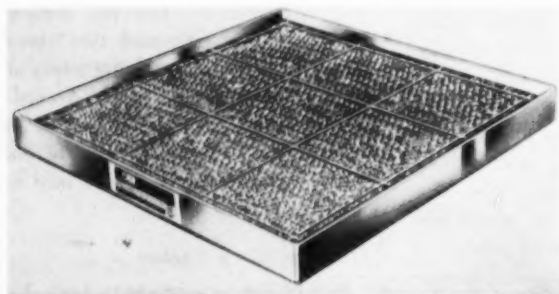
How to Service Panel Type Filters



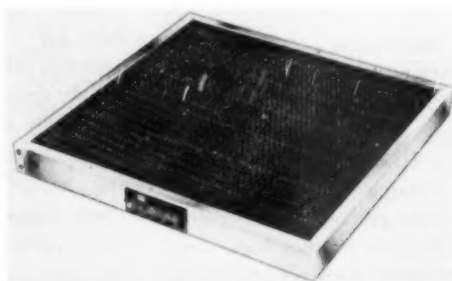
2 COVERED ARE the various ways to service disposable type filters . . .



3 REPLACEABLE MEDIA filters . . .



4 AND CLEANABLE metal filters for light . . .



5 AND HEAVY duty applications

By Carl B. Rowe
Chief Engineer
Research Products Corp.

The author describes how clogged filters affect air conditioning equipment, how filter design characteristics determine the type and frequency of servicing, how cleaning operations are carried out, and how filter servicing can be used as a sales tool

AIR FILTERS in need of servicing have been shown to be responsible for the major portion of the dealer service calls on filter equipped heating and air conditioning equipment. For example, some authorities claim that 95 per cent of the problems requiring service calls on room air conditioners are solved by installing a clean filter in the unit.

It is the purpose of this article to discuss: 1) why panel type filters need servicing; 2) how to tell when servicing is required; 3) the effect of filters requiring service on filter equipped units; 4) filter design features which determine the methods used in servicing; and 5) how the servicing is accomplished.

The two principal factors which generally determine the need for filter servicing are the increase in the filter's resistance to air flow and/or a decrease in the filter's ability to catch dust. The filter design and the type of dust being caught influence whether either or both conditions terminate the filter's period of service.

The methods used to determine when a particular bank of air filters should be serviced should perhaps be classified as more of an art than a precise science. Methods in common use are: 1) Servicing at a given pressure drop as determined by a permanently installed measuring device such as a slant gage (a common value being a pressure drop double that of clean filters); 2) time cycle (such as every two months); 3) visual inspection; 4) reduction in cooling or heating capacity of the filter equipped system.

How Clogged Filters Affect Equipment

Filters which are in good service condition protect the equipment in which they are installed from malfunctions which might result from uncontrolled dirt deposits. They also remove dust, bacteria, and allergens from the air before it is forced back into the living space which is being served by the equipment.

However, a filter which has reached the end of its service cycle can either fail to remove dust effectively, or it can become clogged to the point where the equipment in which the filter is installed does not pass enough air to perform its function adequately. Filters are used for such a variety of applications that it would be impossible to discuss the effects of malfunctioning in all situations. However, some typical effects can be illustrated.

Fig. 1 shows what happens to the operation of a warm

air furnace as the filters become clogged. The curves show the output of the furnace, in Btu per hr, and the air flow through the furnace, in cfm, plotted against the resistance of the filters installed in the furnace. It can be seen that the volume of air flow through the furnace decreases steadily as the resistance to air flow of the filter increases. As this volume of air flow decreases, the air available to carry heat from the furnace's heat exchanger surfaces to the space being heated also decreases. In this case, when the resistance of the filters reached about 0.08 in. of water, the air flow volume was no longer great enough to carry away the heat generated by the furnace's burner as rapidly as the burner generated it. The bonnet temperature then rose to the maximum value and the bonnet temperature limit switch shut off the furnace burner. The result was that greatly reduced quantities of heat per unit of time were carried from the furnace into the heated quarters. Increasing the resistance of the air filters from a value of about 0.08 in. of water to a value of about 0.25 in. of water caused the heat output of this furnace to drop about 25 per cent. Such a condition is a too common cause of "No heat" complaints.

If the servicing of a filter which is installed in an air conditioner is neglected, the filter can either permit enough dirt to pass so that the evaporating coil becomes clogged, or the resistance of the filter can become high enough so that sufficient air does not pass through it. In either case air flow through the system is curtailed. When this condition occurs, the temperature of the evaporator coil is likely to go down below the freezing point of the moisture which has condensed out of the air passing through the coil. This causes the coil to clog up with ice and thus further hamper the operation of the air conditioner. Costly service calls to answer "No cooling" complaints result from such reduced air delivery.

Design Determines Type of Servicing

Panel type filters are serviced in two basic ways, depending on the design of the filter. Some filters are designed for only a limited period of use (Fig. 2) and these are disposed of when they become clogged. A variation of the disposable filter idea is represented by the replaceable media filter (Fig. 3). In this design, a permanent type of frame or grid is used so that the dust collecting portion of the filter can be removed and replaced.

Some filters are designed to be reconditioned and put back into service. These are known as washable filters (Figs. 4 and 5). A variation of the washable filter is the type that can be vacuum cleaned in place. Fig. 4 shows an aluminum filter for use in home furnaces, unit air conditioners and industrial applications where cleaning operations can be supervised. The filter is serviced by cleaning and recoating. Fig. 5 shows a heavy duty aluminum filter for use in industrial and commercial filter banks. Servicing is also by cleaning and recoat-

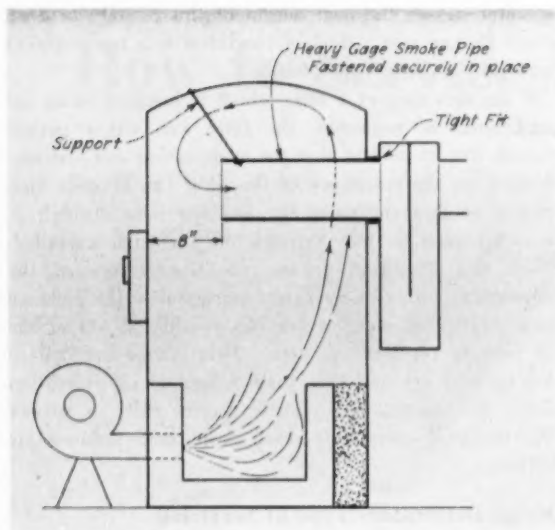
(Please turn to page 104)

Selecting and Servicing Oil Fired Equipment

Here are practical pointers
on how to choose oil burners, furnaces, combustion
chambers, nozzles, and fuel oil to fit specific
jobs, and how to keep equipment in top working condition

By Eugene O. Olson

Chief Engineer, Delavan Mfg. Co.



IF IT IS NECESSARY to oil fire a coal furnace of the crescent radiator type, an effective baffle can be made with a length of heavy gage smoke-pipe. See page 56 of the October Artisan for other methods

EXCESS AIR, high stack temperatures and smoke are the major sources of heat loss in oil burning, as was pointed out in last month's article, *Improving the Efficiency of Oil Fired Equipment*. Cures for these conditions lie in proper selection and servicing of such equipment as the oil burner, the furnace, the combustion chamber and the nozzles, and in the use of the proper fuel oil. We will now treat each of these factors in more detail.

The design of an oil burner is something over which the service man has little or no control. He can choose his oil burner to some extent, but his main role will be to improve the efficiency of oil burners already operating.

Oil burner efficiency can be determined by the use of such instruments as a draft gage, flue gas analyzer, and

stack thermometer. It must be remembered that in order to get an accurate test on an oil burner, all air leaks must be sealed and the burner accessories such as the fan, pump, electrodes and nozzles must be clean and in good operating condition. It is then possible to take CO₂ and smoke readings. Those will determine whether or not the burner can be made to operate efficiently.

A poor reading on a burner may be caused by one or more of several factors (excess air, improper nozzles, etc.). However, it may also be found that the burner has no particularly effective device for mixing air with the oil or creating turbulence in the combustion chamber. In the latter case, it is advisable to install a new burner which is designed to give better efficiency.

It would be extremely difficult to set up any rules for selecting efficient oil burners on the basis of appearance. A complicated firing head does not necessarily mean an efficient one. Neither does the fact that a burner has a simple design mean that it is or is not efficient. It is therefore necessary to depend on reputable manufacturers to supply efficient burners unless there is an opportunity for the dealer to make instrument tests on the burners in installations.

Furnace Baffling Requires Care

The criterion for an efficient furnace is its stack temperature. The furnace must have enough surface and must be designed so that it will absorb the heat put into it by the oil burner. If the stack temperature exceeds 500 to 600 F when the furnace is fired at its rated input and operating under otherwise normal conditions the furnace design is usually not considered to be as efficient as possible. In the case of furnaces, as in the case of oil burners, there is not a great deal that a dealer can do except to use a furnace manufactured by a reputable company. On old installations it is possible in many cases to baffle the furnace and obtain improved results.

In furnaces built with the familiar "doughnut" radiator, it is possible to improve the efficiency by installing

a hanging baffle plate 12 to 16 in. above the combustion chamber. This baffle plate should be small enough to leave several inches all around it for free passage of the products of combustion, but large enough to force those hot gases out against the walls of the furnace. There are also some "trick" ways of baffling the radiator on that type of furnace to improve results, but unless the service man is ingenious enough to figure those out for himself, they might lead to trouble under adverse operating conditions. In all cases, baffling must be done carefully so that the passage of the hot gases through the furnace will not be restricted to such an extent that there will be back pressure in the combustion chamber. It is always necessary to use a draft gage to check for pressure in the combustion chamber when mounting any kind of baffle in a furnace.

On the type of furnace with the so-called "crescent" radiator or the wrap-around type of radiator with the opening at the back of the combustion chamber, the baffling is usually done on the combustion chamber. The chamber is built with a corbel or overhang on the back wall to roll the flame and direct the hot gases away from the back opening. If it is necessary to oil fire a coal furnace of the crescent radiator type, a very effective baffle can be made very simply with a length of heavy gage smokepipe, as shown in the accompanying diagram. When an installation of this kind is made, the material in the pipe should be at least 20 gage steel and preferably 18 gage. It should extend to within about 6 to 8 in. from the front of the furnace. Any corbel should be removed from the back of the combustion chamber to permit the gases to leave the combustion chamber, move up along the back side of the furnace, and wipe across the dome and back down into the baffle pipe. This type of baffle has been known to reduce stack temperature more than 100 F. It should be well supported to make sure that it can never fall into the combustion chamber. If the furnace is not over fired, an 18 gage pipe should last for years.

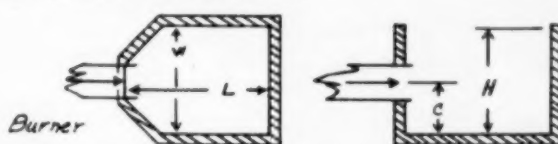
In a conversion job on this type of furnace, it is sometimes found that an adjustable direct draft damper is installed to bypass the products of combustion directly to the smokepipe and not through the radiator. In many cases these dampers become warped and do not fit properly, resulting in a very high stack temperature. For an oil burner installation in this type of furnace, these dampers should be cemented shut and the handle taken off.

It goes without saying that on any conversion job the furnace should be inspected and the furnace must be free of leaks of any kind before an oil burner is installed.

What's Proper Chamber Shape and Size?

The purpose of the combustion chamber is to maintain a high temperature in the combustion zone. This makes for complete clean burning of the oil and permits use of a minimum amount of excess air. It is also possible to design a combustion chamber in such a way as to assist the burner in its job of mixing the air and the atomized

Combustion Chamber Dimensions Recommended by the Author for Various Nozzle Characteristics



Nozzle Size (gph)	Spray Angle (deg)	L Length (in.)	W Width (in.)	H Height (min.)	Noz. to Fl. (in.)	Diam. Round (in.)
0.75-0.85	60	10	8	12	4	*
	80	9	9	13	5	10
1.00-1.10	45	14	7	12	4	*
	60	12	9	13	5	*
	80	11	10	14	6	11
1.25-1.35	45	15	8	11	5	*
	60	13	10	14	6	*
	80	12	11	15	7	12-13
1.50-1.65	45	16	10	12	6	*
	60	14	11	14	7	*
	80	13	12	15	7	14
1.75-2.00	45	18	11	14	6	*
	60	16	12	15	7	*
	80	15	13	16	8	16
2.25-2.50	45	19	12	14	7	*
	60	18	13	15	8	*
	80	16	15	16	8	18
3.00	45	22	13	15	7	*
	60	20	14	17	8	*
	80	18	16	18	9	20

*Recommend oblong chamber for narrow sprays.

1. These dimensions are for average conversion burners. Burners with special firing heads may require special chambers.

2. Higher back wall, flame baffle or corbelled back wall increase efficiency in many jobs.

3. The combustion chamber floor should in all cases be at least 2 in. insulating brick.

4. For larger sizes use the same approximate proportions and 90 sq in. of floor area per 1 gph.

oil. Some service men also design the chamber to direct the hot gases as they leave the chamber so they will wipe the heating surfaces more effectively.

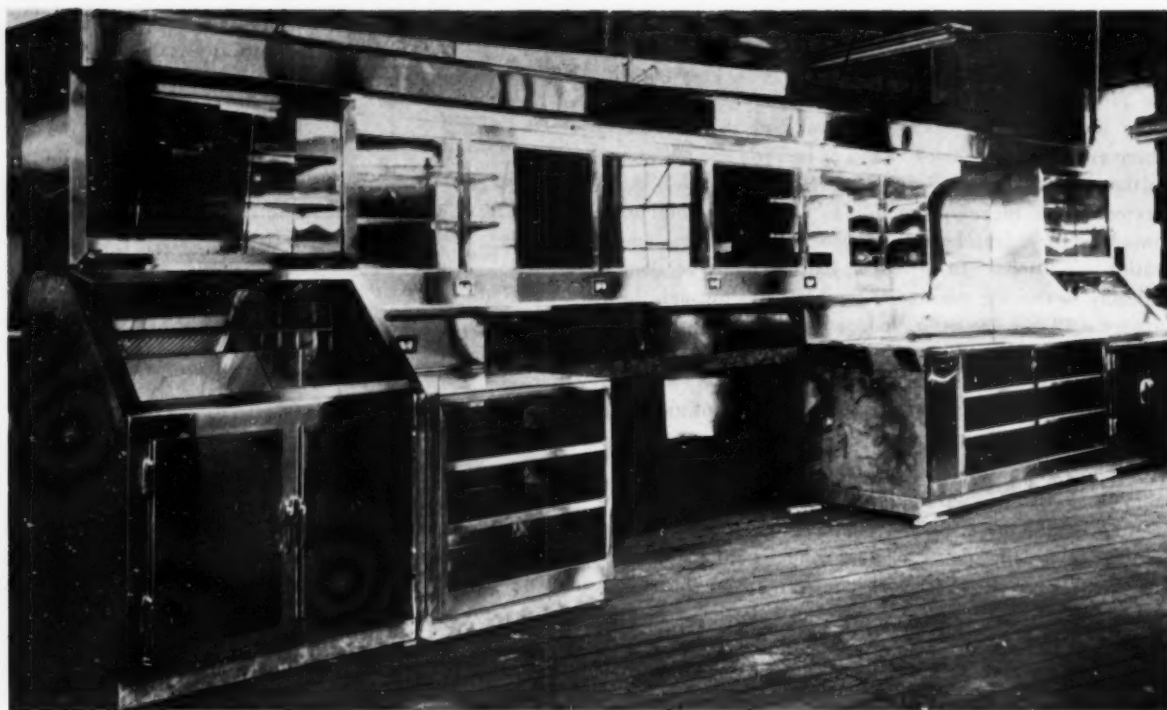
One common fault of combustion chambers is the height. For example, chambers for 1.35 gph nozzles should be at least 14 in. high, in my opinion. There should be at least as much chamber above the nozzle as below it, and preferably more.

The size of the combustion chamber is important in some cases and unimportant in others. There is also some disagreement among burner manufacturers as to the proper combustion chamber size.

As a general rule it is safe to provide 90 to 100 sq in. of floor area of combustion chamber per 1.0 gph fuel input. This is approximate, and it is the basis of the suggested sizes shown in the accompanying table. These figures are considered satisfactory, although not meeting the requirements of some burner manufacturers or combustion chamber manufacturers.

The shape of the chamber is important in some cases. It is reasonable that a 45 deg nozzle should have a different shape of combustion chamber from that used for an 80 or 90 deg nozzle. It is also reasonable that a burner which gives a wide short flame should have a dif-

(Please turn to page 134)



IN FABRICATING stainless steel equipment such as this restaurant kitchen unit, the sheet metal man should avoid permanent contact of stainless with baser metals (iron or steel screws, nails, supporting hardware, etc.) to prevent the electrical battery effect which causes galvanic corrosion

Proper Handling Will

Prevent Stainless Steel Corrosion

By A. R. Stargardter

Washington Steel Co.

Three main types of corrosion — galvanic, cell solution, and overall chemical attack — are described. The fabricator can avoid them by following a few simple rules

DUE TO ITS strength, luster, and ability to resist tarnishing and corrosion from ordinary atmospheric influences and a broad range of corrosive chemicals, stainless steel is being used in an ever increasing number of applications. Large increases in its production started soon after the development of the 18-8 grades some 25 years ago. Annual production of all grades of stainless has increased from a modest 55,000 ingot tons in 1934 to the current annual rate of over 900,000 ingot tons per year. Stainless steel weather stripping, kitchen and restaurant

equipment, store fronts, architectural trim, roof drainage equipment, drug and chemical plant equipment, laboratory and hospital equipment, and many other types of installations attest to the versatility of the material.

By this time the average fabricator is well versed in the handling of stainless steel structures and installations. Service failures due to improper practices on the part of fabricators or ultimate users are few. However, they do exist.

The general public, as well as many stainless steel

users and a few fabricators, occasionally seem to be under the impression that stainless steel cannot corrode regardless of how it is handled or serviced. This belief, stemming from lack of proper information, has resulted in needless deterioration of some costly stainless steel installations.

No metal is completely corrosion resistant. Although the general corrosion resistance of the more noble metals (which include stainless steel) is superior to that of the baser metals and alloys, under certain conditions any metal to some extent will corrode or be chemically attacked. The various corrosion effects may be described under three general classifications: galvanic action, local electro-chemical effects, and overall chemical attack.

We will attempt to explain as simply as possible the nature of these corrosive influences and the steps necessary to avoid their deleterious effects.

What Is Galvanic Corrosion?

Galvanic corrosion is the accelerated electro-chemical corrosion resulting when one metal is in contact with a more noble metal, both being immersed in or wetted by the same solution or electrolyte. All of the metals may be listed in what is known as the "galvanic series," forming the following list in which the upper metals are anodic or less noble and the lower metals are cathodic or more noble:

Corroded End (anodic or least noble)

Magnesium
Zinc
Aluminum
Cadmium
Iron and ordinary steel
Lead-tin solders
Lead
Tin
Brass
Copper
Copper alloys
Silver solder
Stainless steel
Silver
Gold
Platinum

Protected End (cathodic or most noble)

Thus, if strips of zinc and copper are connected and immersed in dilute acid, an electric current is set up and zinc, which is well above copper in the galvanic series, will be corroded while copper, which is lower and more noble in the series, will be unattacked. The same would be true if the lower metal had been stainless steel, silver, or gold. However, if the less noble metal is far greater in mass than the more noble metal, and the two are in contact under conditions which could produce galvanic action, the ensuing galvanic corrosion is of far less consequence than if the reverse were true.

For example, if iron rivets or bolts are used to fasten stainless steel sheets, under the influence of atmospheric moisture the iron rivets or bolts will be galvanically attacked, in time rusting away. The resulting corrosion products of the iron will in a short time cause pit-corrosion of the surrounding stainless steel areas. However, if stainless steel bolts or rivets are used to fasten carbon

steel sheets under the same atmospheric conditions, no attack takes place.

Care Required in Selecting Fasteners

Although the principles of galvanic corrosion have been known for approximately 200 years, they have been and are being occasionally ignored, and often with disastrous results. Nearly 200 years ago, the bottom of the British frigate H.M.S. Alarm was sheathed with 12 oz copper for protection against marine organisms. However, these early fabricators used iron nails to hold the copper sheathing, and before the first voyage was over, the iron nails corroded away due to galvanic action in sea water with the more noble copper bottom, and most of the latter fell off and was lost. It is interesting to note that the same result would have been experienced had the iron nails been used in contact with stainless steel sheets, or even gold ones.

In the early 1930's the same type of error was committed in sheathing a large office building with stainless steel sheets. The fabricator used iron rivets and in a short time the inexorable galvanic action set in with the result that the less noble iron rivets were galvanically corroded and the stainless steel sheathing became marred. The stainless surfaces soon became corroded due to pit-type corrosion from contact with the iron salts from the corroded rivets. Needless to say, the entire installation had to be replaced, using stainless steel rivets.

Recently, a prominent roofer complained of deterioration of his stainless steel roof gutters. He had used malleable iron hangers to support the 18-8 gutters. The iron-rich products of galvanic corrosion of the less noble malleable iron hangers seeped over the surrounding stainless surfaces, resulting in the same type of failure as was experienced in the case of the office building. The roofer claimed that the stainless steel should not have corroded, but the installation would not have been satisfactory if he had installed golden gutters, had he committed the same error in using iron supports. Stainless steel supporting hardware should have been used in contact with the stainless steel gutter surfaces.

How Solution Concentrations Cause Corrosion

The majority of localized corrosion—that is, corrosion not caused by galvanic action—may be attributed to concentration cell corrosion. This results from the existence of different concentrations of electrolyte (which may be almost any water solution) on the surface of a metal. If the metal is in contact with different concentrations of a solution, potential differences and current flow will result, causing localized corrosion attack, which is described as concentration cell or solution cell corrosion. This condition is associated with atmospheric condensation in crevices, residual scale, surface deposits and other conditions conducive to differentials in concentration of solutions in contact with the metal. Very often riveted lap-joints offer conditions favoring differences in concentration resulting from stagnation and differential

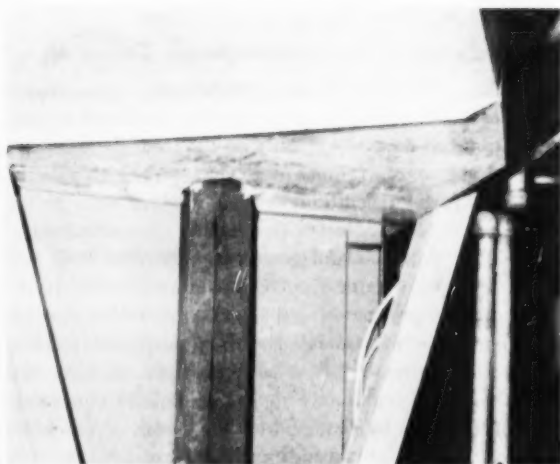
(Please turn to page 108)



1 A SWITCH to southern comfort—this New Orleans home is now equipped with two 5 ton and one 3 ton year 'round air conditioners

Convert from Gravity to Year 'Round Conditioning

Many special problems
were overcome in renovating the
duct system in a New Orleans home to handle the air
distribution and increased volume required



2 THE SUPPLY DUCT had to straddle the center floor support column



3 A MODULATING DAMPER is used on this branch duct, in the attic, supplying the second floor

"THEY GAVE US everything we wanted when we weren't sure of what we wanted ourselves." This was the way Mrs. Harold Weil described the air conditioning system installed in her spacious New Orleans home. The contractor was Ernest Burguières of Ernest Engineering, Inc., who had no small job on his hands when he undertook to replace two gravity warm air furnaces and to convert the existing duct system to handle the air distribution and volume required for year 'round air conditioning.

Further complicating the job was the owner's wish that the existing architectural scheme be disturbed as little as possible. It was also desired that the duct system be interconnected in such a manner that a portion of the air normally supplied the second floor would be diverted to the first floor to supply the extra cooling required on occasions when large numbers of guests were being entertained. In addition, it was decided by the owner and contractor that ductwork would be exposed only in the attic, not in the main part of the house.

A survey and consequent load estimate indicated that about 13 tons of cooling would be required. It was decided that this could best be supplied by three separate units, two 5 ton and one 3 ton air conditioners, complete with furnace, filters, humidifiers and cooling equipment.

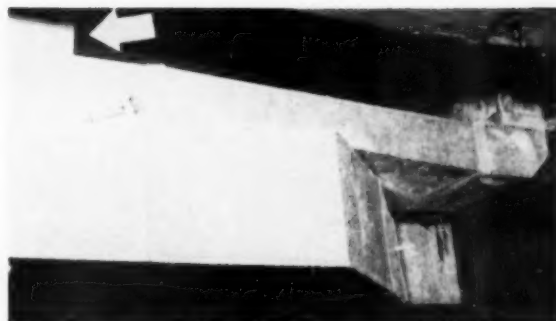
Duct System a Layout Problem

The old gravity furnaces were disassembled and removed and the three new units placed and connected to the water and gas supplies. Then began the job of fitting the duct system to the existing gravity ducts and adding the new supplies. There was little space available for the overhead air supply plenum (Fig. 2). The wooden columns supporting the floor above had to be straddled by the main supply duct. The ducts were fabricated so that the column is shielded to reduce the resistance of the obstruction and to eliminate the possibility of air leakage. This duct forms the plenum for one 5 ton and the 3 ton unit.

The main supply ducts are run to the third floor where individual ducts are taken off to achieve the air distribution desired. Each room on the first and second floors is supplied by its own duct. Fig. 3 shows one of the branch ducts that is exposed in the attic hallway. As this duct turns down to supply the sewing room on the second floor a take-off is made to provide conditioning to the maid's room. The modulating damper automatically controls the quantity of air supplied to this zone of the house as the load increases or decreases with the exposure.

Unlike this exposed duct, most of the risers are located in the 14 in. space between partition walls. This was one of the few structural features that aided Mr. Burguières in keeping the ducts out of sight and maintaining the same decorating pattern. The architect who had made the original plans believed in large closets, and the unused space between closet locations made excellent riser areas. Fig. 4 shows two take-offs that pass between the partition walls. As can be seen, many short fittings were necessary to bend the duct around existing obstructions.

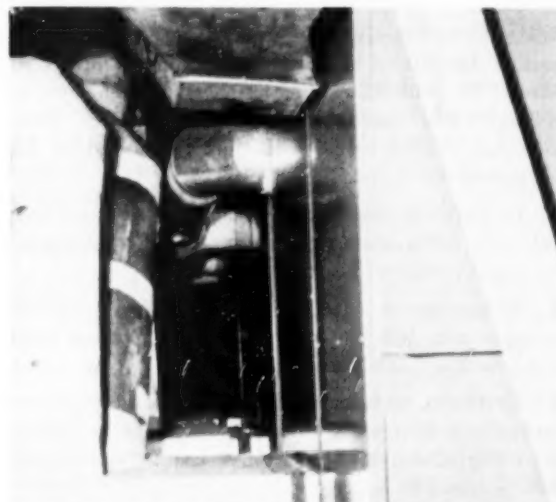
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4 SUPPLY TRUNK LINES had to be fitted around existing building construction. Arrow shows take-off fitting and the limited space in which it had to be connected to the supply



5 THE SUPERVISING ENGINEER takes the temperature of the air leaving one of the few new supply openings. The floor grille, formerly used for supply, is now the return opening for the reception hall



6 OLD GRAVITY SUPPLY and return ducts were cut into these return plenums and now feed the air into the return intake. At the right is the round smoke pipe to the chimney. The duct at top is for supply



SPEAKERS AND THEIR WIVES at the 20th anniversary dinner of the Fox Valley (Ill.) Furnace and Sheet Metal Contractors Association are: (l. to r.) Mr. and Mrs. W. D. Redrup, W. P. Kilgore, and Mr. and Mrs. Jack Stowell



FIVE "FRAS" of warm air progress were outlined by W. D. Redrup — gravity, forced air, education, perimeter heating and cooling of homes, and heating of large buildings

Local Associations Play Important Role

. . . by carrying on educational programs, developing new techniques, and promoting good will on the local, industry-wide and national levels, Fox Valley, Ill., contractors are told on 20th anniversary

RECENTLY THE Fox Valley Furnace and Sheet Metal Contractors Association held its 20th anniversary dinner in Aurora, Ill., with 12 charter members in attendance as well as 80 other members, their wives and guests. President Jack Stowell reviewed the purposes for which the association was founded:

- 1** To enable contractors to become better acquainted with their fellow contractors and to exchange ideas that will result in mutual benefit
- 2** To institute an educational program for contractor members and their employees in installation and business practices
- 3** To develop techniques that will enable the warm air heating and sheet metal industry to continue to expand and will give the customer the best heating system possible

Mr. Stowell went on to point out some of the early achievements of the Fox Valley association that are now standard practices throughout the country. In 1934, after much study, an accurate method of determining the heat

loss of a building was developed, along with an estimating sheet for tabulating and laying out jobs. Also in 1934, the association held its first educational conference with Professor S. Konzo, of the University of Illinois, who explained the findings of the research department of the university relating to forced warm air heating systems. This meeting was so successful that in 1935, when Professor Konzo returned to conduct another session on this subject, there were over 400 warm air heating dealers from many parts of the state in attendance. The conducting of educational programs has continued throughout the years.

Reach a Cross Section of the Industry

This group has carried the principle of "good will through association" to all of the different branches of the industry. During the summer of 1934 it instituted the annual field day at which contractors, salesmen, jobbers and manufacturers' representatives gather to play golf, pitch horseshoes and enjoy a steak dinner together. This activity has been continued each year, and to build

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DEALERS PRIMARILY concerned with industrial and other large building work often use general terminology in their truck advertising (*left*), while those who do primarily residential work usually list specific items which they can furnish or fabricate (*right*)

Truck Advertising —

Costs Little, Is Effective

By Lawrence E. Gichner

Sheet Metal Contractor

By following a few simple rules, the heating, air conditioning and sheet metal dealer can make the most of his truck advertising. The message should be brief and large enough to be read quickly. Also important is the cleanliness of the sign and the truck

ONE OF THE cheapest and most effective mediums of advertising for a heating, air conditioning and sheet metal shop is a good truck sign. In any active community, such trucks are seen by many motorists and pedestrians as they pass through the streets on their rounds.

By observing three simple rules in regard to these signs, the dealer can obtain the best in sales results for his firm and his product. They are:

- 1 Make the message brief
- 2 Make it large enough to be seen
- 3 Keep the sign and truck clean

In the flash of an eye a truck is past the observer. If the sign is too wordy and lettering is too small, it is lost in the on-swooping traffic. If an advertising story is to be put across, it must be brief and large enough to be caught at a fleeting glance.

Brevity a Problem

The average sheet metal contractor has a real problem in saying all he would like to all the people he would like. He is involved in a great variety of work ranging

from air conditioning installations and heating jobs to roofing and fabricating special equipment. However, the dealer who does primarily residential work would accomplish more in putting his story across by selecting a single item to feature on his sign — attic fans, stainless steel hoods, etc. — rather than using the words "sheet metal." A recent survey has shown that the average citizen does not know just what these words mean. A different item could be featured on each side of the truck.

However, if the dealer concentrates on work in commercial or industrial buildings, he need have no fear that his business will not be properly advertised by his trucks if he uses the words "sheet metal," or other general terms.

Details Vary with Special Needs

Although this is not true in every case, those dealers who do primarily residential work usually use larger signs with more "splashy" colors. This is in marked contrast to those who contract for industrial or commercial work. Their signs are smaller, conservatively colored, with the simple classification, "Sheet Metal & Roofing Contractor," or a similar term, painted on the door or shown on a small plaque on the side of the truck.

The prevailing color of truck bodies in the heating and sheet metal field seems to be red, which catches

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Housing Census Heating Data

Flint • Greenville • Lincoln • New Britain • Phoenix • Pittsburgh

SUGGESTIONS on how a warm air heating dealer can use some of the housing data available from the Bureau of Census were given in the May 1953 American Artisan. Localities covered in the reports are metropolitan

areas that are socially and economically integrated with the central city. Data for various areas has been reported in American Artisan for June to October, inclusive. Additional reports will appear regularly.

Types of Fuel Used in Centrally Heated Dwelling Units

	Standard Metropolitan Areas											
	Flint Mich.	Greenville S.C.	Lincoln Neb.	New Britain-Bristol Conn.			Phoenix	Pittsburgh				
	Genesee County	Greenville County	Lancaster County	The area	*Part of Hartford County	*Part of Litchfield County	Maricopa County	The area	Allegheny County	Beaver County	Washington County	West moreland County
All dwelling units	80,652	47,857	37,116	43,436	40,189	3,247	108,047	628,470	430,680	48,845	59,940	89,005
Number reporting heating equipment	77,545	45,040	35,530	42,165	39,305	2,860	92,465	606,555	415,770	47,130	58,085	85,570
Central heating	55,505	7,790	28,410	26,080	24,710	1,370	21,985	444,995	302,720	38,140	38,400	65,735
Coal	33,480	3,765	5,940	10,385	9,740	645	120	254,000	143,370	27,795	30,270	52,565
Wood	160	85	125	120	115	5	105	1,070	835	65	55	115
Utility gas	7,785	95	19,785	1,180	1,040	140	20,200	182,405	154,195	9,695	7,375	11,140
Bottled Gas	120	80	215	105	95	10	530	1,005	730	30	95	150
Liquid fuel	13,345	3,515	1,850	13,430	12,915	515	475	2,150	1,005	295	120	730
Other fuel	395	210	345	775	725	50	430	2,965	1,565	170	320	910
Not reporting	220	40	150	85	80	5	125	1,400	1,020	90	165	125

*The New Britain-Bristol standard metropolitan area comprises the following parts of Hartford and Litchfield Counties: Bristol and New Britain cities, and Berlin, Plainfield and Southington towns in Hartford County; Plymouth town in Litchfield.

Types of Nonfarm Dwelling Units, by Type of Heating and Year Built

	Total occupied						Owner occupied			Renter occupied					
	Total	1 dwelling unit, detached	Other 1, and 2 dwelling unit	3 and 4 dwelling unit	5 to 9 dwelling unit	10 dwelling unit or more	Total	1 dwelling unit, detached	All other dwell- ing units	Total	1 dwelling unit, detached	Other 1, and 2 dwelling unit	3 and 4 dwelling unit	5 to 9 dwelling unit	10 dwelling unit or more
Standard Metropolitan Area of Flint, Mich.—Genesee County															
All occupied units	70,860	54,695	9,035	4,570	1,590	970	51,565	46,855	4,710	19,295	7,840	5,425	3,690	1,440	900
HEATING EQUIPMENT															
Central heating	46,060	34,073	6,346	3,484	1,258	699	33,833	30,247	3,586	12,227	3,826	3,882	2,740	1,120	659
Piped steam or hot water	5,253	2,319	922	933	564	515	2,699	2,108	591	2,554	211	514	798	526	505
Warm air furnace	40,807	31,754	5,624	2,551	694	184	31,134	28,139	2,995	9,673	3,615	3,368	1,942	594	154
Noncentral heating, with flue	15,185	13,100	1,219	672	150	44	10,850	10,306	554	4,325	2,794	746	604	137	44
Nonctrl. htng., without flue; or not htd.	2,255	1,951	103	88	69	44	1,598	1,575	23	657	376	103	65	69	44
Not reported	7,361	5,570	1,167	326	114	184	5,273	4,725	548	2,088	845	694	281	114	154
YEAR BUILT															
1945 or later	7,834	7,404	284	75	21	50	6,863	6,730	133	971	674	151	75	21	50
1940 to 1944	6,244	5,864	80	25	...	275	5,540	5,460	80	704	404	...	25	...	275
1939 or earlier	53,803	39,640	8,215	4,068	1,335	545	37,916	33,471	4,445	15,887	6,169	4,870	3,188	1,185	475
Not reported	2,979	1,787	457	402	233	100	1,247	1,194	53	1,732	593	404	402	233	100
Standard Metropolitan Area of Greenville, S. C.—Greenville County															
All occupied units	37,945	27,220	7,510	1,855	1,015	345	17,180	15,605	1,575	20,765	11,615	6,155	1,685	970	340
HEATING EQUIPMENT															
Central heating	7,561	5,417	819	450	415	260	4,711	4,391	320	2,650	1,026	553	416	400	255
Piped steam or hot water	2,060	1,062	225	241	272	260	858	705	153	1,202	357	92	241	257	255
Warm air furnace	5,501	4,355	594	209	143	...	3,853	3,686	167	1,448	669	461	175	143	...
Noncentral heating, with flue	27,687	19,848	6,023	1,187	572	57	11,516	10,306	1,210	16,171	9,542	4,979	1,051	542	57
Nonctrl. htng., without flue; or not htd.	2,376	1,575	597	175	29	...	727	683	44	1,649	892	553	175	29	...
Not reported	524	383	69	44	...	28	227	227	...	297	156	69	44	...	28
YEAR BUILT															
1945 or later	8,510	6,846	846	149	441	28	5,393	5,246	147	2,917	1,600	699	149	441	28
1940 to 1944	2,510	1,969	403	50	88	...	1,472	1,472	...	1,038	497	403	50	88	...
1939 or earlier	26,113	17,698	6,014	1,632	457	312	9,902	8,538	1,364	16,211	9,160	4,865	1,462	412	312
Not reported	1,009	707	248	25	29	...	408	348	60	601	359	188	25	29	...

Types of Nonfarm Dwelling Units, by Type of Heating and Year Built

	Total occupied						Owner occupied			Renter occupied					
	Total	1 dwelling unit, detached	Other 1, and 2 dwelling unit	3 and 4 dwelling unit	5 to 9 dwelling unit	10 dwelling unit or more	Total	1 dwelling unit, detached	All other dwelling units	Total	1 dwelling unit, detached	Other 1, and 2 dwelling unit	3 and 4 dwelling unit	5 to 9 dwelling unit	10 dwelling unit or more
Standard Metropolitan Area of Lincoln, Neb.—Lancaster County															
All occupied units	33,500	20,230	4,875	3,630	2,415	2,350	19,310	16,615	2,695	14,190	3,615	2,955	3,075	2,275	2,270
HEATING EQUIPMENT															
Central heating	27,151	15,794	4,298	2,694	2,213	2,152	15,879	13,427	2,452	11,272	2,367	2,502	2,218	2,073	2,112
Piped steam or hot water	5,210	1,115	427	734	1,196	1,738	1,183	878	305	4,027	237	262	681	1,149	1,698
Warm air furnace	21,941	14,679	5,871	1,960	1,017	414	14,696	12,549	2,147	7,245	2,130	2,240	1,537	924	414
Noncentral heating, with flue	4,705	3,424	437	580	138	106	2,725	2,542	183	1,980	882	334	527	158	79
Nonctrl. htng., without flue; or not htd.	1,064	560	116	264	45	79	344	323	21	720	237	95	264	45	79
Not reported	581	452	24	92	...	13	362	323	39	219	129	24	66
YEAR BUILT															
1945 or later	2,787	2,020	430	241	...	96	2,001	1,796	205	786	224	280	186	...	96
1940 to 1944	2,198	1,122	61	676	339	...	1,068	1,038	30	1,130	84	31	676	339	...
1939 or earlier	27,386	16,638	4,137	2,517	2,048	2,046	15,883	13,583	2,300	11,503	3,055	2,457	2,073	1,956	1,982
Not reported	1,126	448	247	195	28	208	355	196	159	771	252	187	140	...	192
Standard Metropolitan Area of New Britain and Bristol, Conn.—Parts of Hartford and Litchfield Counties															
All occupied units	39,555	13,980	10,835	8,960	4,330	1,450	18,890	12,040	6,850	20,665	1,940	6,660	6,680	3,975	1,410
HEATING EQUIPMENT															
Central heating	24,331	10,998	6,653	4,271	1,207	1,202	14,706	9,997	4,709	9,625	1,001	3,645	2,694	1,123	1,162
Piped steam or hot water	14,336	5,684	3,807	2,600	1,117	1,128	8,084	5,100	2,984	6,252	584	2,011	1,536	1,033	1,088
Warm air furnace	9,995	5,314	2,846	1,671	90	74	6,622	4,897	1,725	3,373	417	1,634	1,158	90	74
Noncentral heating, with flue	12,796	2,431	3,461	3,938	2,768	198	3,522	1,617	1,905	9,274	814	2,451	3,273	2,338	198
Nonctrl. htng., without flue; or not htd.	2,119	441	658	665	355	...	532	537	195	1,587	104	525	646	314	...
Not reported	309	110	65	86	...	50	130	89	41	179	21	41	67	...	50
YEAR BUILT															
1945 or later	2,968	2,616	216	27	109	...	2,207	2,125	82	761	491	134	27	109	...
1940 to 1944	5,186	2,909	1,052	639	245	341	2,835	2,754	81	2,351	155	971	639	245	341
1939 or earlier	31,061	8,245	9,486	8,268	3,976	1,086	13,690	7,003	6,687	17,371	1,242	5,474	5,988	3,621	1,046
Not reported	339	209	81	26	...	23	157	157	...	182	52	81	26	...	23
Standard Metropolitan Area of Phoenix, Ariz.—Maricopa County															
All occupied units	88,365	70,630	9,000	4,230	3,105	1,400	50,950	48,165	2,785	37,415	22,465	6,840	3,805	2,965	1,340
HEATING EQUIPMENT															
Central heating	20,630	16,813	1,582	1,052	612	571	14,866	14,306	560	5,764	2,507	1,082	992	612	571
Piped steam or hot water	3,583	2,230	339	266	506	242	1,961	1,851	110	1,422	379	259	236	306	242
Warm air furnace	17,247	14,583	1,243	786	506	329	12,905	12,455	450	4,342	2,128	823	756	306	329
Noncentral heating, with flue	25,534	20,771	2,347	1,296	722	198	14,986	14,175	811	10,348	6,596	1,667	1,205	682	198
Nonctrl. htng., without flue; or not htd.	38,507	30,055	4,544	1,715	1,680	513	18,950	17,747	1,203	19,557	12,308	3,724	1,442	1,600	483
Not reported	3,893	2,992	528	165	90	118	2,148	1,938	210	1,745	1,054	368	165	70	88
YEAR BUILT															
1945 or later	33,571	28,742	2,461	1,019	911	438	23,891	23,024	867	9,680	5,718	1,853	865	806	438
1940 to 1944	11,303	8,721	679	942	910	51	6,467	6,147	320	4,836	2,574	436	865	910	51
1939 or earlier	39,387	29,899	5,580	2,095	1,066	747	18,900	17,460	1,440	20,487	12,439	4,333	1,902	1,066	747
Not reported	4,043	3,271	279	173	217	103	1,633	1,537	96	2,410	1,734	218	173	182	103
Standard Metropolitan Area of Pittsburgh, Pa.—Allegheny, Beaver, Washington and Westmoreland Counties															
All occupied units	581,450	295,985	173,810	61,035	29,815	20,805	315,545	237,275	78,270	265,905	58,710	109,000	50,065	27,860	20,270
HEATING EQUIPMENT															
Central heating	420,162	236,105	113,736	36,086	17,698	16,537	260,366	201,786	58,580	159,796	34,319	65,167	27,925	16,231	16,154
Piped steam or hot water	125,726	55,572	32,254	13,992	10,120	13,788	64,445	47,003	17,442	61,281	8,569	18,449	11,265	9,455	13,543
Warm air furnace	294,436	180,535	81,482	22,094	7,578	2,749	195,921	154,783	41,138	98,515	25,750	46,718	16,660	6,776	2,611
Noncentral heating, with flue	126,073	48,937	47,381	18,473	8,802	2,480	45,199	29,338	15,861	80,874	19,599	34,015	16,356	8,479	2,434
Nonctrl. htng., without flue; or not htd.	26,990	7,424	10,231	5,368	2,868	1,099	6,361	3,690	2,671	20,629	3,734	8,080	4,961	2,770	1,084
Not reported	8,226	3,518	2,463	1,108	448	689	3,620	2,460	1,160	4,606	1,058	1,739	823	389	597
YEAR BUILT															
1945 or later	45,640	38,137	5,128	666	879	2,830	35,332	33,726	1,606	10,308	4,411	1,692	551	848	2,806
1940 to 1944	36,031	20,572	3,971	2,064	4,835	4,589	20,243	18,517	1,726	15,788	2,055	2,756	1,863	4,525	4,589
1939 or earlier	488,805	232,813	165,343	56,559	23,249	12,839	255,988	182,215	73,775	232,815	50,600	102,095	46,077	21,666	12,377
Not reported	10,977	4,464	3,367	1,746	853	547	3,983	2,820	1,163	6,994	1,644	2,456	1,574	822	498



In 6½ Days — Metal Panels Sheathe Large Building

EIGHTEEN HUNDRED prefabricated, die pressed aluminum wall and window panels make up the outer sheath of a new 26 story office building at 99 Park Ave. in New York City. This is New York's first aluminum clad office building.

The panels are two stories high and 4½ ft wide, consisting of two windows, two spandrels and a right and left hand mullion completely pre-assembled. Panels of this size allow the use of extruded aluminum members in long lengths, giving added strength, eliminating horizontal joints, and presenting long, clean uninterrupted vertical lines at vertical mullions and column covers on the face. This construction is designed to reduce the amount of flashing required.

Caulking of metal to metal has been eliminated between panels, since weathertightness is achieved through the specially designed eliminator and baffle joint extruded integrally with the panel flange. Stainless steel weatherstripping around each window gives further protection and eases the load on the air conditioning system. (The building is completely air conditioned).

The joints between the panels are designed to allow for expansion and contraction.

The spandrel is a die formed unit of alumilite sheet.

This type of sheet is intended to allow the architect a wide latitude of designs — embossed or impressed, or a combination of both. A four faceted geometrical design is die pressed on the spandrel below each window.

The windows have a vertically pivoted reversible sash which permits all cleaning to be done from the interior. To provide a barrier against street noises, the interior surface of each panel was pre-sprayed under high pressure with a special coating of sound-deadening carbozite. Each panel was also infused with a grayish tint to soften the glare that such a large metallic surface would otherwise produce. However, all the window frames and the sash are of polished aluminum, to provide contrasting trim.

Construction Completed in Record Time

Originally scheduled to take 12 working days, the job of sheathing the building framework was actually completed in about half that time. The panels were delivered to the building as they came off the assembly line, and were stacked on each of the floors they were to enclose.

Three crews put all the pieces in place. All the installation work was done from inside the building, no exterior scaffolding being necessary. Each of the panels



PANELS WERE GUIDED into place (*left*) from inside the building, no exterior scaffolding being required, and rapidly bolted to the stanchions (*right*) . . .



AFTER WHICH FLASHING was added (*left*) and sealed by caulking (*right*). No caulking was required between panels on the same level because of the eliminator and baffle joint extruded integrally with the panel flange

was guided into place by workmen inside the structure, and the panels were then bolted to steel brackets previously welded to the framework.

The \$14 million building was built and is owned by

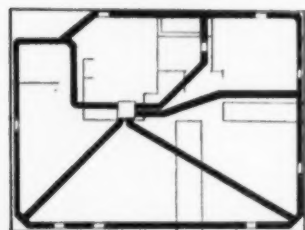
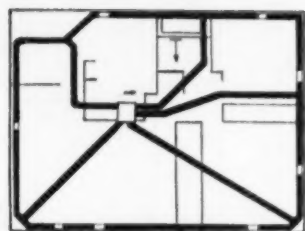
the Tishman Realty & Construction Co., Inc. The General Bronze Corp. prefabricated and installed the finished panels, and Emery Roth & Sons, architects, designed the building.

PROMOTING SAFETY IN CONSTRUCTION INDUSTRY

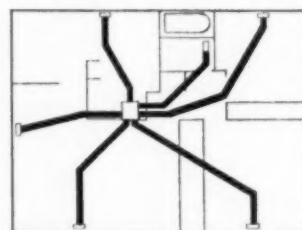
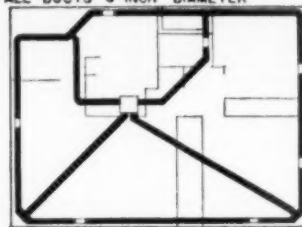
ENFORCEMENT OF safe practices in building construction is particularly difficult because of hand-me-down construction habits, prejudice against safety equipment, and the fact that few contractors have an organized accident prevention program, according to Erwin N. Ziner, safety engineer, John A. Volpe Construction Co. Speaking before the 41st National Safety Congress, held in Chicago last month, he added that in his own company, a bonus is

given to superintendents and foremen who maintain the best safety records.

Mr. Ziner feels that lack of pre-employment physical examinations is probably the most important factor conducive to hazards. He urged both management and labor groups to give serious consideration to the establishment of some sort of basic standards, which would "provide teeth" for any enforcement program.



NOTE: ALL DUCTS 6-INCH DIAMETER

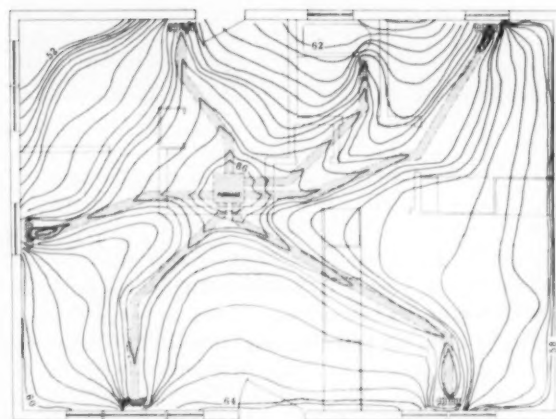
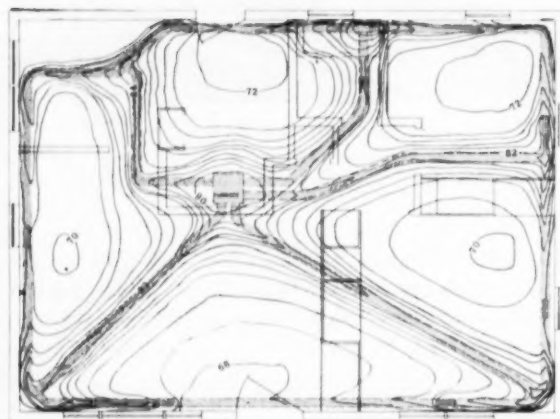


SERIES R-2 2-14'X14' FLOOR REG



1 IN TESTING these arrangements of 6 in. duct installed in a slab floor home, researchers studied the . . .

Results of Heating with Perimeter Loop, Radial Systems



2 . . . WHICH INCLUDED warm floor: surfaces (shown for the perimeter loop system, *left*, and the perimeter radial system, *right*) and other conditions promoting comfort. Contour lines are for 2 F increments

By S. Konzo
University of Illinois

IN THE PREVIOUS article of this series, the performances of a 6 in. loop system and a 6 in. radial system were compared on the basis of the room air temperatures obtained. The two basic types of systems studied in Warm Air Heating Research Residence No. 3 are shown in Fig. 1. In the previous discussion, evidence was offered that the loop system gave slightly better room air temperature conditions than the radial system, but that both systems gave superior results to those for the conventional overhead duct system. In this article, additional evidence will be given on other factors affecting the complete performance of a heating system.

As indicated previously in the discussion of the 3 in. diameter loop system, one of the main reasons for embedding the warm air ducts in the floor slab is to provide warm floor surfaces, particularly near the edges of the slab. The temperature patterns, or profiles of temperature variations, of the floor surface are shown for the loop system and the radial system in Fig. 2. These temperature contour maps were drawn from readings made at 170 different points on the floor surface. These maps can be interpreted in the same manner as is a conventional contour map for hills and valleys. Whenever a rapid change in surface temperature is occurring, such as near a feeder duct, the constant temperature lines are drawn closely together. Wherever the lines are drawn far apart, it may be concluded that the temperatures are relatively uniform. The lines shown are for 2 F increments.

Although the maps may be somewhat difficult to interpret, the following observations can be made from a critical analysis:

a) With the loop system, a greater portion of the total floor surface was at a temperature of 70 F or higher. Only 7 per cent of the floor surface was at a temperature less than 70 F, and this was concentrated in the vicinity of the front door.

b) With the radial system, 43 per cent of the floor area was at a temperature less than 70 F, and 16 per cent was below 65 F. A large portion of this low temperature area was in the living room. It would appear desirable to provide another radial feeder in the living room.

c) As a matter of interest, previous

studies with an overhead, conventional warm air system had indicated that 100 per cent of the floor area was at a temperature less than 70 F, and about 50 per cent less than 65 F.

d) A very small area existed near the furnace where the floor surface temperatures were between 85 F and 90 F. In the normal area of occupancy, a floor surface temperature of 85 F is considered to be the maximum permissible, but in aisles and borders, a value of 120 F is commonly accepted as a maximum allowable temperature. The small areas in these studies which were above 85 F were not normal areas of occupancy, so that the slight excess in temperature was not considered to be a serious deficiency.

Floor Temperatures Vary

The temperature profiles shown in Fig. 2 were for outdoor temperatures of about 34 F. As in the case of room air temperatures, the floor surface temperatures are also affected by the outdoor temperature. For the purpose of showing such effects, two locations on the floor were selected, as indicated in Fig. 3. Station D-22 was in the exposed corner of the Residence, and Station D-15 was near the exposed edge, but not over any embedded ducts. The following comments apply to the data shown in Fig. 3, as well as similar data for two other selected stations:

a) If the station selected is immediately above an embedded duct, the temperature of the floor surface increases as the weather becomes colder. This is true for both the loop and radial systems. This tendency can be explained by the fact that colder weather requires warmer duct air temperatures, which in turn causes higher floor surface temperatures.

b) At Station D-15, the floor surface temperatures remained practically constant with the loop system, but decreased with colder weather for the radial system.

c) In the exposed corners of the building, Station D-22, the floor-surface temperatures increased with colder weather for the loop system, but decreased in the case of the radial system.

d) In general, therefore, the temperature profiles shown in Fig. 2, left, for the loop system can be considered to be characteristic of the entire range of weather conditions. In fact, in many areas the floor surface temperatures become warmer as the weather gets colder.

e) The temperature profiles shown in Fig. 2, right, for the radial system will not be as good in severe weather. In fact, the warm spots over the ducts will become warmer, but the cold spots away from the influence of the feeder ducts will become colder.

f) From the comparison shown in Fig. 2, a practical interpretation may be made. In extremely cold climates, the loop system is to be preferred to the radial system,

**How We Got
Where We Are In**

WARM AIR PERIMETER HEATING

**the 11th in a series
planned to tell about:**

► **Investigations in the Research Residences at the University of Illinois**

► **Design and installation data (condensed from manuals published by the National Warm Air Heating and Air Conditioning Association)**

► **Specific phases of warm air heating**

... in articles so far:

► **heating basementless homes**

► **warm air ceiling panels**

► **heating slab floor homes with ceiling and floor panel systems**

► **floor panel-convection heating for slab floor homes — partially open and completely open**

► **survey of field practices**

► **new research residence built**

► **comparison of two loop perimeter and three convection systems**

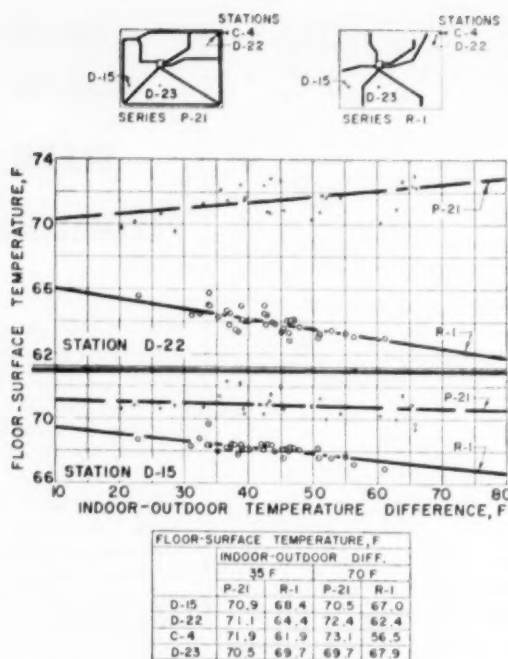
► **comparison of perimeter loop and two loop system**

► **loop vs. radial system**

... in articles to come:

► **perimeter laboratory studies**

► **crawl space heating**



3 HOW OUTDOOR temperature affected floor surface temperatures at selected locations

whereas in mild climates the difference in floor surface temperature may not be significant.

How Much Panel Heating?

In both the loop and radial systems, that portion of the heated floor surface which is warmed by subfloor ducts produces a panel heating effect. In order to satisfy the heating requirements of a given room, the larger the panel heating effect, the smaller becomes the convection heating effect of the registers. As far as is now known, no definite per cent of panel heating effect to the total heat delivery can be established as

the best. Experience has indicated that in a completely closed circuit panel heating system, such as has been described in earlier articles of this series, the room air temperature conditions were highly satisfactory, but some deficiencies were observed in slow response, in temperature over-runs, and in hot spots on the floor surface. On the other hand, the conventional overhead warm air system which provides no panel heating effect was responsive to outdoor temperature changes, but did not provide completely satisfactory room air temperatures or floor surface temper-

atures. In other words, it would appear that somewhere between a 0 per cent and a 100 per cent panel heating effect lies the answer to the best compromise system.

For the purpose of determining the relative percentages of total heat delivery to the room that could be accounted for by panel heating effect, the values in Table 1 were calculated from well known heat transfer equations. The most significant conclusions that can be drawn from the data are:

- For the loop system, about 44 per cent of the total heat energy supplied to the room was in the form of panel heating effect.
- For the radial system about 16 per cent of the total was by panel heating.
- For the 8 in. diameter loop system described previously, the percentage was 25 per cent.

Plant Performances Similar

Complete performance data for the furnace and blower was obtained over a wide range of outdoor temperatures. In general, with the exception of fuel consumption and burner operating time, the plant performances for all four series of tests were about the same. Typical performance data for an average winter day is summarized in Table 2.

The fuel consumptions for the four series are compared in Table 3. The consumption for the radial system was about 16 per cent less than that for the loop system. This has been attributed to the larger subfloor and edge losses with the loop system, as

Table 1—Heat Emitted from Floor and through Registers for Perimeter Loop and Perimeter Radial Heating Systems

Perimeter Loop System				Perimeter Radial System						
Room	Heat Emission from Floor (Btu/hr)			Heat From Reg.	Total to Room	Heat Emission from Floor (Btu/hr)			Heat From Reg.	Total to Room
	Radia- tion	Convec- tion	Total	(Btu/ hr)	(Btu/ hr)	Radia- tion	Convec- tion	Total	(Btu/ hr)	(Btu/ hr)
Liv. Rm. . .	1,260	630	1,890	1,940	3,830	440	440	880	5,020	3,900
S. Bedrm. . .	650	300	950	1,500	2,540	—70	70	0	1,770	1,770
N. Bedrm. . .	420	230	650	1,800	2,450	—10	80	70	1,830	1,900
Hall	190	210	400	—	400	110	170	280	—	280
Bathroom . .	120	100	220	320	540	—20	30	10	1,260	1,270
Kitchen . . .	—	—	—	—	—	—	—	—	—	—
Utility . . .	680	470	1,150	1,080	2,230	320	390	710	2,240	2,950
Total	3,320	1,940	5,260	6,730	11,990	770	1,180	1,950	10,120	12,070

Weather: Series P-21 — outdoor temp. 35 F, wind 7.5 mph (SSE), sky overcast; Series R-1 — outdoor temp. 36 F, wind 3 mph (SSE), sky overcast

Table 2—Summary of Performance Data for Burner and Blower for Series P-21 at an Outdoor Temperature of 35 F

1. Blower operation, hr per day	24
2. Electrical input to blower motor, watt- hr per day	3,100
3. Average bonnet air temperature, F	110
4. Burner operations, hr per day	8
5. Burner operations, per 24 hr	167
6. Average flue gas temperature, F	220
7. Fuel consumption, cu ft per day	470

Table 3—Comparison of Fuel Consumptions of Perimeter Loop and Perimeter Radial Systems

Series	Fuel Consumption, cu ft per day	
	Outdoor Temp. 35 F	Outdoor Temp. 0 F
P-21	470	940
P-23	460	910
R-1	400	750
R-2	390	780

Table 4—Pressure Losses for Perimeter Loop and Perimeter Radial Systems

Series	Pressure Loss, in. of water		Air Flow Rate, cfm
	Warm Air Return Air	Total	
P-21	0.08	0.05	0.13
P-25	0.11	0.05	0.16
R-1	0.12	0.05	0.17
R-2	0.16	0.04	0.20

a result of the proximity of the heated perimeter duct to the exposed slab edge.

Pressure Losses Analyzed

Measurements of pressure losses for the duct system are shown in Table 4. The following comments can be made from the data presented:

a) The least pressure loss was obtained with the loop system having the larger non-deflecting type of registers. The greatest pressure loss was with the radial system in which the narrow deflecting type registers were used.

b) The narrow deflecting registers increased the pressure loss about 0.03 in. of water as compared with the wider non-deflecting registers.

c) A substantial proportion of the total pressure loss was in the warm air duct system. An analysis indicated that the pressure loss in the perimeter loop was extremely small, and that the two main components of the loss consisted of feeder duct loss and register loss. At the time of this writing little reliable data is available concerning the pressure loss through some of the special types of registers and baseboard diffusers that have been developed for this application.

Overall Performance Compared

Although the discussion has not included all the factors that might have affected the comparison of the loop and radial systems, the most important have been presented. For the sake of brevity, an overall comparison can be made (Table 5).

It can be seen from Table 5 that the comfort performance of the loop system was better than that for the radial system, but the costs were higher. As a result of the studies reported in this article, some changes were incorporated in the design manual for radial systems,* as issued by the National Warm Air Heating and Air Conditioning Association. It should be apparent that the performance of the radial system would be dependent upon the number of radial feeders used; better results should be obtained with larger num-

Table 5—Overall Comparison of Observed Performance of Loop and Radial Systems

Factor Compared	Better Performance Shown by:
1. Temperature control	Same
2. Balancing of room air temperature	Loop System
3. Minimum temperature differential in rooms	Loop System
4. Uniformity of floor surface temperatures	Loop System
5. Least affected by outdoor temperature changes	Loop System
6. Least fuel consumption	Radial System
7. Least initial cost	Radial System
8. Least pressure loss in ducts	Loop System

bers of feeder ducts in use. Furthermore, the use of 6 in. ducts gave results for this Residence that were equal to or better than those with the use of 8 in. ducts. Again, however, attention must be directed to the fact that a larger number of feeder ducts were used with the smaller duct sys-

tem. The conclusion reached from these extensive studies over a three year period was that the warm air heating industry was provided with one, if not two, new forms of heating systems for special application to houses built over a concrete slab floor.

Parts of this article are condensed from the article, Performance of Warm-Air Perimeter-Loop and Perimeter-Radial Systems in a Residence, by H. T. Gilkey, R. W. Roose, and M. E. Childs, which appeared in Heating, Pip-ing & Air Conditioning, October 1953.

*Manual 4, Warm Air Perimeter Heating as Applied to Structures without Basements, Third Edition, 1953.

QUICK SERVICE WITH RADIO-EQUIPPED TRUCKS



LEO SMITH, driver of the service van, takes a call on his radio phone. With him is service man Herbert Hoffman

MOBILE flexibility and two-way radio are helping the S. S. Fretz Co., Philadelphia, to get service men where and when they are needed in the city's crowded downtown area.

With an average of 2000 to 2500 service calls a month, a large amount of time was formerly being lost in trying to find parking space. The Fretz company has managed to save much of this time, according to Airtemp Div., Chrysler Corp., by having its radio truck driver drop three to five service men off on scheduled downtown calls, and, after completing the first trip, drive to a side area to await orders to pick up the service men when their calls are completed.

Since March, the van has saved \$2 to \$3 a day per service man, who otherwise would have to use separate trucks and pay parking fees. The average daily number of service calls per man has been increased from five to eight.

The truck is completely equipped with filters, refrigerant, and spare parts for air conditioners. While awaiting dispatching orders, it delivers filters and parts to near-downtown locations where parking is not a problem.

In addition to saving money, according to W. J. Heggie, president of the company, the radio-equipped van has contributed much to building customer good will by making it possible to have a man on the job just a few minutes after the call has been received.



1 EVAPORATIVE COOLERS may be installed with ducts (and located on a platform at the side of the building, as shown, or on the roof) . . .



2 OR WITHOUT ducts, the cooler being mounted on the outside of the building (*left*) and the grille being so placed in the window (*right*) that the bottom sash may be lowered in front of it

How to Install Evaporative Coolers

The equal friction and velocity methods for designing evaporative cooling duct systems are described along with ductless applications and the registers used for both types of installation

By Robert S. Ash
Professional Engineer

EVAPORATIVE COOLERS may be installed with or without ducts and can be located either on a roof or a platform along the side of a building. A wall location using duct distribution of air is shown in Fig. 1.

In areas where evaporative cooling is gaining wider acceptance in existing houses and other buildings, the ductless system installation predominates. An advantage of this method of installation lies in the

relative ease with which it may be made and in the lower cost.

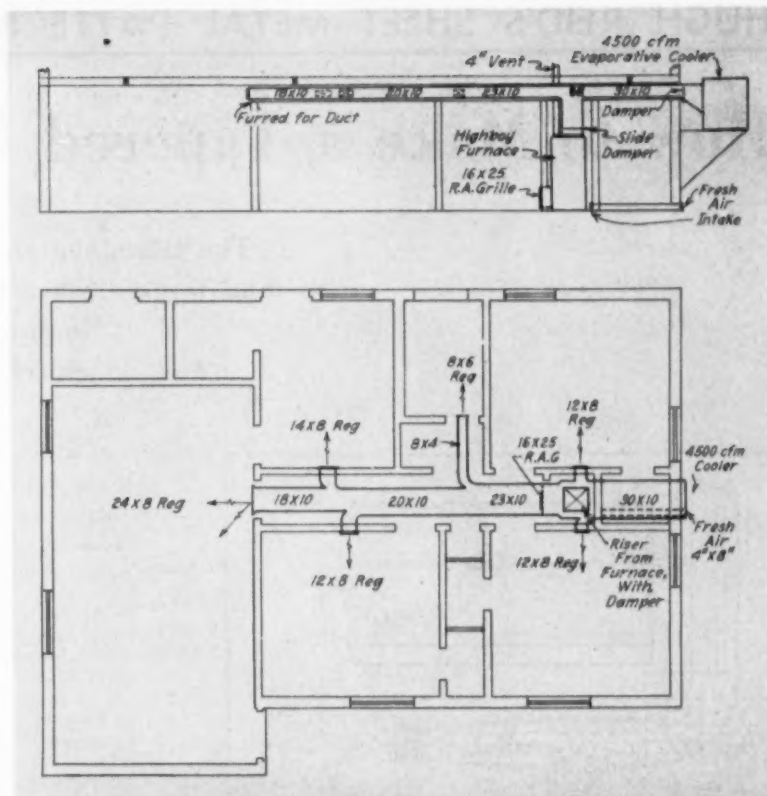
The Ductless Installation

Fig. 2 illustrates the inside and outside views of a typical installation of

this type. The cooler is mounted on the outside of the building, with a short extension duct, directional grille and side panels mounted in the lower sash of a double hung window.

A top horizontal blower type cooler is usually used in such installations so that the view through the window will be as clear and unobstructed as possible. The grille is so placed in the window that the bottom sash may be lowered in front of it when the cooler is not in use. This arrangement has an additional advantage. Because the sash position can be adjusted, the amount of air discharged from the cooler may be regulated, providing controlled cooling. On the hottest days, the sash will be raised above the top of the grille to secure maximum cooling. On other days the sash may be pulled down partly over the grille to reduce the flow of air to that amount needed for comfort.

Both the water valve and the electric switch knobs are mounted in the adjustable side panels for accessibility to the occupants. An electric extension cord is normally furnished so that the cooler may be plugged into a convenient room outlet. These accessories tend to make the large blower type cooler almost as easy to install as the smaller one room propeller fan type cooler. An individual cooler can often be used to cool a house of five rooms, depending upon



3 THIS DISTRIBUTION SYSTEM for the evaporative cooler installation shown in Fig. 1 is utilized for heating as well

the arrangement of the rooms in the floor plan.

If the orientation of the house permits, the unit should be placed on the east, north or south side to prevent the pads from absorbing solar energy and transmitting it to the air stream. Because of the high altitude of the sun during the warmer part of the day, the south side is less disadvantageous than one might believe.

The ductless type of installation has certain limitations. The room in which the cooler is installed may be quite drafty; since the air picks up heat as it travels through the house, the rooms furthest from the cooler will usually be 8 to 10 F warmer. These disadvantages may be overcome through the use of a system for duct distribution of the cooled air. An outlet register should be located in each room.

Designing Simple Duct Systems

In designing duct systems for use with evaporative coolers, the two

methods widely used are the equal friction method and the velocity method. The equal friction method should be used only for simple duct designs where the equivalent lengths of the duct branches do not vary materially.

It should be remembered that this method is not recommended for use in designing systems having several runs of widely different lengths or long runs with many outlets.

For the equal friction method, friction loss per unit length of ductwork is maintained constant throughout the system. The choice of pressure loss per unit of length depends on the highest allowable velocity in the duct system in cases where the blower size for the cooler capacity is not already established but can be selected for the conditions that exist. In cases where the blower capacity is fixed, it is necessary to divide the capacity available for external resistance, less the resistance of the grille on the longest or the most

(Please turn to page 98)

WHY'S AND HOW'S OF EVAPORATIVE COOLING

This is the fifth in a series covering evaporative cooling.

ARTICLES SO FAR:

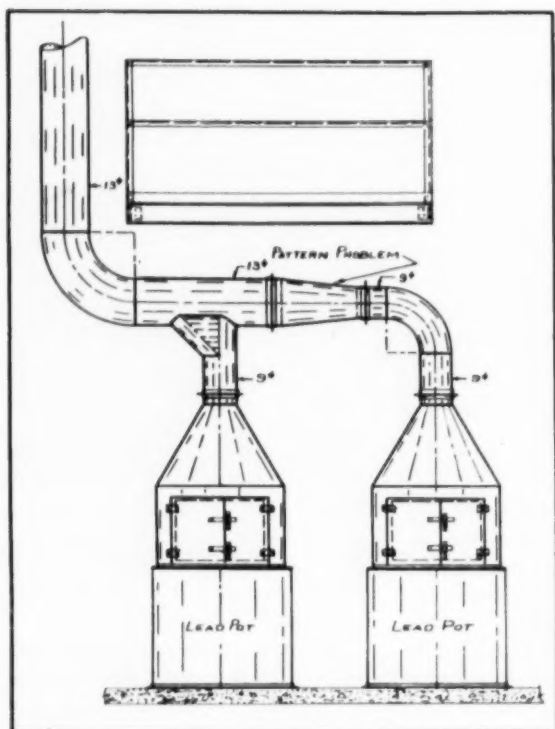
- ▶ How evaporative cooling works (July issue)
- ▶ Types of coolers (August issue)
- ▶ Cooler design and construction (September issue)
- ▶ Sizing the cooler (October issue)
- ▶ Design of cooler installations (this issue)

ARTICLE TO COME:

- ▶ The cooler industry and its sales

How to Make a Tapered Duct Fitting

The triangulation rather than the radial line method is used when the taper angle is slight, as in the problem illustration of an exhaust system for two lead pots



1 A SIMPLIFIED triangulation method is used to lay out the tapered duct fitting in this exhaust system for two lead pots

A PRACTICAL illustration of the pattern problem is the exhaust system for two lead pots shown in Fig. 1. The cfm requirements for the exhaust for this type of operation are calculated by multiplying the recommended control velocity by the area (in square feet) of all the openings in the hood. Assume that the door opening is $4\frac{1}{2}$ sq ft and the recommended control velocity is 200 fpm per sq ft of opening. The cfm per lead pot will be 200×4.5 , or 900 cfm. The recommended velocity for lead fumes is 2000 cfm. When the volume in cfm and the velocity in fpm are known, the pipe area in square feet is calculated by dividing the volume by the velocity; thus $900 \text{ cfm} \div 2000 \text{ fpm} = 0.45 \text{ sq ft}$, which is equal to a 9 in. diameter pipe.

Both the lead pots are the same, so identical hoods with a 9 in. diameter duct opening outlet will be required for each operation.

The large end of the tapered duct can be calculated by either of the following methods:

(a) Adding the area in square inches of the two 9 in. diameter ducts and using the sum of these areas to calculate the required diameter. Example: The area of a 9 in. diameter duct is 63.62 sq in.; $63.62 \times 2 = 127.24 \text{ sq in.}$, which is approximately equal to a 13 in. diameter duct.

(b) Find the volume of air in cfm which is exhausted by both lead pots and divide the total by the design velocity which is 2000 fpm. Example: Total volume = 1800 cfm \div 2000 velocity fpm = 0.90 sq ft, which is equal to a 13 in. diameter duct.

In Fig. 1, a bottom shoe tee tap-in to the main exhaust duct is shown; however, such a tap-in should be avoided whenever possible. The recommended procedure is that the tap-in be made on the side of the main duct.

To determine the length of the taper of the problem fitting, a good rule to follow is that all changes in duct sizes be made with the taper section fittings having a ratio of not less than five to one. To calculate the length of the taper shown in Fig. 1, subtract 9 in. from 13 in., divide the answer by 2 and multiply by 5. Thus, $13 - 9 = 4$; $4 \div 2 = 2$; $2 \times 5 = 10 \text{ in.}$

A second recommendation is that the slope angle of the tapered section shall not exceed 30 deg.

Two Methods Possible

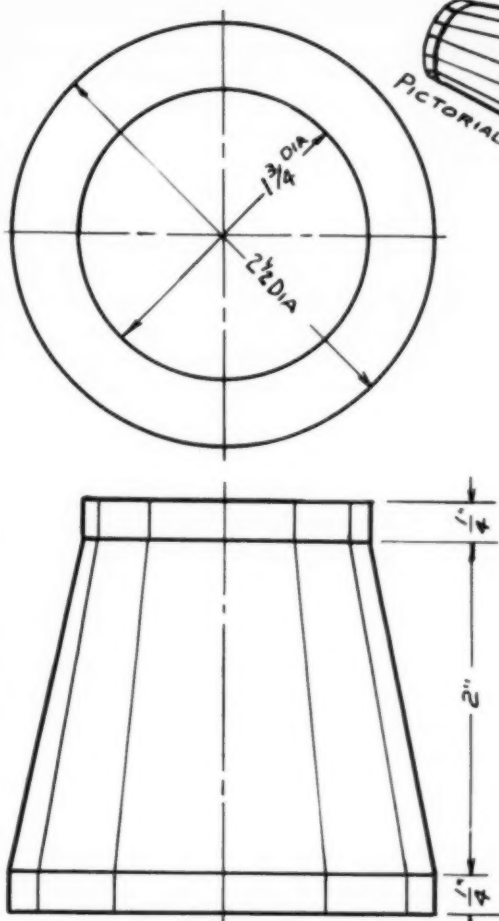
The two methods of layout for this type of problem are the radial line method and layout by triangulation.

The radial line method is the simplest and fastest of the two and should be used whenever possible. However, there are many fittings of this type in which the taper angle is so slight that it would be impossible to use the radial line method, and the simplified triangulation method, as shown by Fig. 3, is the practical solution to the problem.

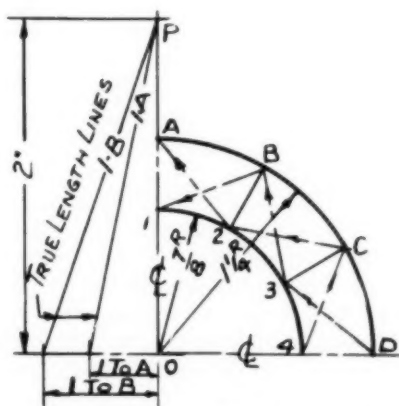
The following is a step by step analysis of the pattern problem solution.

To Construct Simplified Method Drawing, Fig. 3:

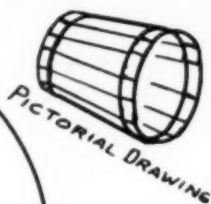
(a) Draw the horizontal and vertical center lines marked CL and mark the intersection point O.



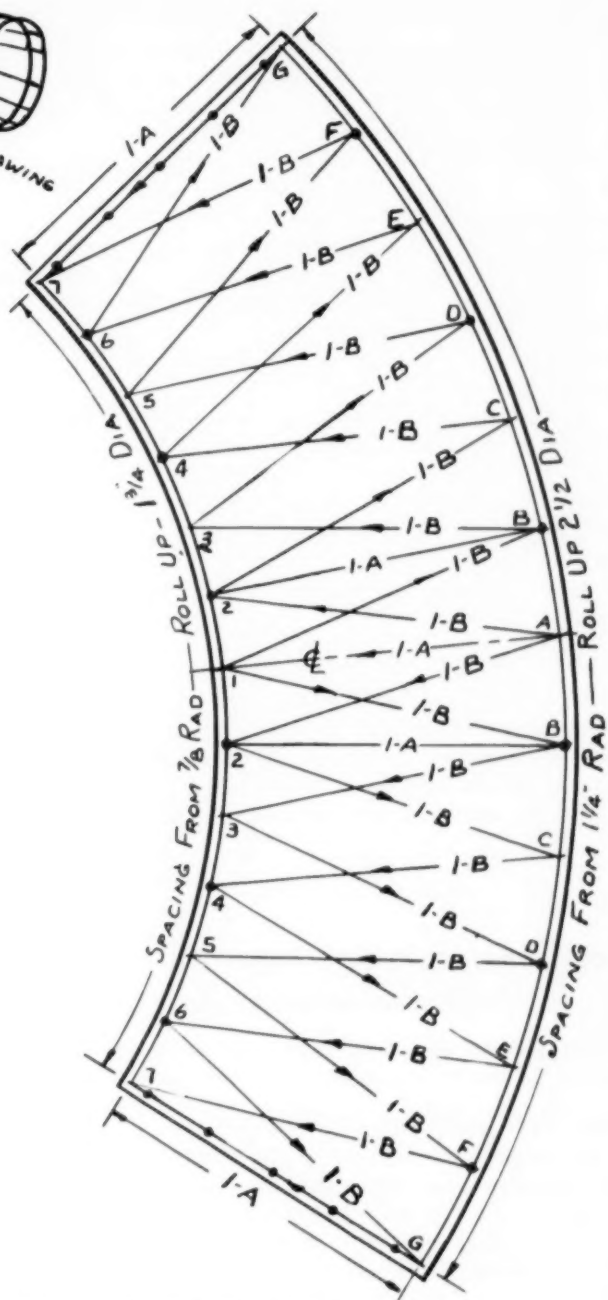
2 PLAN VIEW (top) and front view (bottom) show the taper angle to be slight, indicating



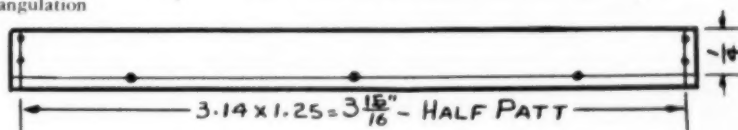
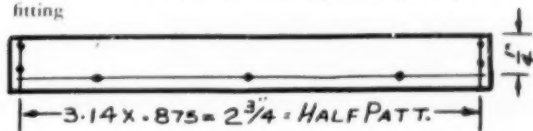
3 . . . THE USE OF the simplified triangulation method. True length line 1-B is used



PICTORIAL DRAWING



4 . . . IN FORMING the full pattern for the fitting



(b) With point O as center and a radius of $\frac{7}{8}$ in., draw a 90 deg arc. Divide the arc into three equal spaces.

(c) With point O as center and a radius of $1\frac{1}{4}$ in., draw a 90 deg arc and divide the arc into three equal spaces. Mark the equally spaced points on the large arc A, B, C, and D, and the equally spaced points on the small arc 1, 2, 3, and 4. Draw lines connecting points D to 3, and 4 to C. [Note: When diagonal lines D-3, 4-C, 3-B, C-2, 2-A, and B-1 are checked, it will be found that they are all equal in length. The parallel lines 4-D, 3-C, 2-B, 1-A are also equal in length. From this analysis it is concluded that the complete pattern can be developed from the section on the quarter plan, Fig. 3, marked 4-D-3-C, and the true vertical height line O-P, which is 2 in.]

(d) From point O measure 2 in. on the vertical center line and mark the point P.

(e) Extend the horizontal center line O-D to the left. Measure lengths 1-A and 1-B on the quarter plan, and with point O on the horizontal line as center transfer these distances to the extended horizontal center line. Through the points draw lines to P and mark the lines 1-A and 1-B.

To Lay Out Full Pattern, Fig. 4:

(a) The practical shop method of layout for this type of problem would require two dividers, preferably of different sizes, and a trammel. The small divider is set at a distance equal to one of the equal spaces on the small radius of the quarter circle; the large divider is

set at a distance equal to one of the equal spaces on the large radius of the quarter circle; and the trammel is set at a radius equal to line 1-B on Fig. 3.

(b) Draw a horizontal line and on this line establish the point A. From Fig. 3 set a compass equal to line 1-A, and with point A on Fig. 4 as center, draw an arc and mark the point of intersection 1.

(c) Beginning at point A on Fig. 4 as center, and with the distance of the true length line 1-B as radius for the trammel, draw arcs on both sides of line 1-A. With point 1, Fig. 4, as center, and with the distance of the true length line 1-B as radius for the trammel, draw arcs on both sides of center line 1-A. Using the small divider setting and with point 1 as center, cut the arcs 1-B and mark the points 2. With A as center and using the large divider setting, cut the arcs 1-B and mark the points B.

(d) Without moving the trammel or compass setting, repeat the procedure by going from 2-C, B-3, 3-D, C-4, 4-E, D-5, 5-F, E-6, F-7, 6-G; and stepping off the spacings A, B, C, D, E, F, G, with the large divider setting and spacings 1, 2, 3, 4, 5, 6, 7, with the small divider setting.

(e) Through the developed points draw the pattern outline.

To lay out the collar pattern, multiply the given collar diameters by the constant 3.14, and draw rectangles with lengths equal to the collar circumference and width equal to the collar length.

Add allowances for seams and joints, lay out holes for riveting and mark the patterns for fabrication.

LOCAL ASSOCIATIONS IMPORTANT —

(Continued from page 68)

further understanding between the association and its friends, an annual get-together is held each spring.

Five "Eras" of Warm Air Progress

Mr. Redrup, in a brief address of congratulation to the association, said that associations make it possible for men to work together toward a common goal and that the spirit of cooperation shown by the Fox Valley group would be difficult to surpass. He also outlined the aid given by the Fox Valley association to the National Warm Air Heating and Air Conditioning Association when the difficult task of developing a warm air code was started. Mr. Redrup said that the development of the warm air heating industry could be divided into five periods of expansion — the gravity heating era, the forced air systems era, the educational era, the residential perimeter heating and cooling era, and the era of perimeter heating of large buildings with slab floors. Each era represents a period of extensive activity, and the last two have not as yet reached their maximum potential, he feels.

Mr. Redrup concluded by pointing out that the warm air heating system is the most important equipment that goes into a house, and that by working together, those in warm air heating will be able to provide heating systems that will give the home owner more comfort and enjoyment than any other item put into his home. He said, "It is associations like the Fox Valley Furnace and Sheet Metal Contractors Association that are important factors in the continued development of our industry."

Associations Influence Legislation

William F. Kilgore, vice president, Fox Valley Manufacturers Association, spoke on *Where Are We Going?* He pointed out that the continued growth of any industry is based upon national environment, and that Americans should not only look to their associations for new ways to develop their markets but should make sure that the government of the United States does not assume too much of a "big brother" role. Mr. Kilgore explained how unscrupulous persons may bend existing laws to fit purposes other than those for which they were originally intended. He said it is through groups such as the Fox Valley association that elected representatives are influenced to pass laws that will aid our nation.

**BRADFORD VENEER &
PANEL CO., INC.**

Bradford, Vermont

*Architects—E. H. and M. K. Hunter
in Hanover, N. H.*

Another case of
COPPER
where it counts!

IN THIS CLOSE-UP note how well the Revere Copper fascia gravel stops fit the design of the building ... how a neat installation can be made with soldered seams. Soldering Revere Copper is always a quick, certain operation.

The use of Revere Sheet Copper for fascia gravel stops in buildings of modern design is becoming more and more popular. Architects prefer to use this "ageless," non-rusting metal because of its superb lasting qualities and its extreme flexibility in design treatment. Sheet metal contractors prefer Revere Copper because it is easy to handle, readily worked and is a "natural" for soldering. These many qualities, which are not incorporated in any other single metal, build prestige and protect the reputation of all concerned.

The fascia gravel stops on this plant office of the Bradford Veneer and Panel Co., Inc., were made from 16-oz. Revere Cold Rolled Sheets. Fascia strips are 4" down with 5" extending on the roof, and 8' long with soldered seams. The stops were installed by Jancewicz and Son, Bellows Falls, Vt.

In addition to Revere Sheet Copper, this building used 1,120 ft. of Revere Copper Water Tube for the radiant panel heating system.

Be safe, be sure ... use Revere Copper. A Revere Distributor near you stocks Revere Sheet, Strip or Roll Copper for flashing and roofing. Particularly ask him about the money-saving advantages of Revere Keystone Thru-Wall Flashing.* And, if you have technical problems, your Revere Distributor will put you in touch with Revere's Technical Advisory Service.**Patented*

REVERE

COPPER AND BRASS INCORPORATED

*Founded by Paul Revere in 1801
230 Park Avenue, New York 17, N. Y.*

*Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.;
Los Angeles and Riverside: Calif.; New Bedford, Mass.; Rome, N. Y.
Sales Offices in Principal Cities, Distributors Everywhere.*

SEE "MEET THE PRESS" ON NBC TELEVISION, SUNDAYS



SAME SWITCHETTE on all three limit controls simplifies service. Mounts simply by tightening easily accessible mounting and ter-

minal screws. Enclosed switchette construction helps protect vital contacts against damage from handling.

EASY TO INSTALL!

3 new G-E limit controls for any type

Easy to install and service, plus versatility . . . those are three big features of the three new General Electric limit controls. Designed to operate on any type furnace—warm air, hot water or steam—these units give positive, dependable operation, helping assure the homeowner of close temperature control at all times. Available with either normal or reserve-acting contacts. But take a look at the added advantages these three new controls offer.

NEW WATER IMMERSION TEMPERATURE CONTROL

The simple design of this G-E immersion temperature control means that it will give long, reliable service. Snap-on cover and finger-operation lock clip on the detachable dry well speed up installation. Thermo-sensitive assembly can be removed without draining boiler. All it takes to set is a coin or a screwdriver—you don't need to remove the cover. All forms available including fast acting form suitable for tankless hot water installations.

NEW HOT AIR LIMIT CONTROL

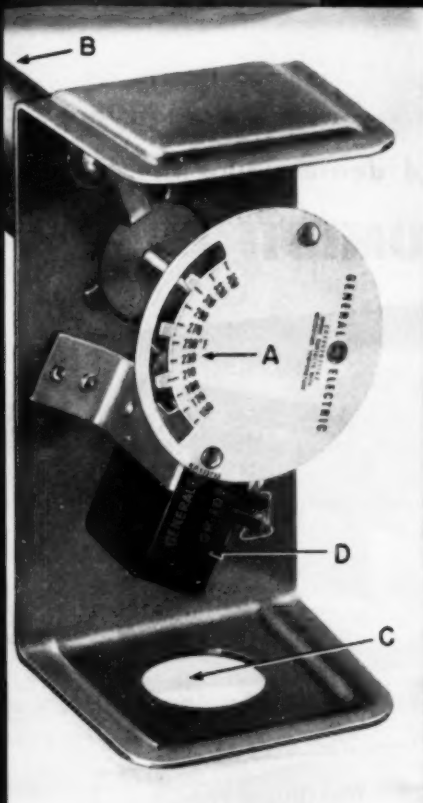
A new control for warm-air furnaces that's light, sturdy, easy to work with. It mounts in any position . . . no leveling required. Generous conduit opening takes either BX* or standard fittings. Fixed stops at 200 F, 250 F, and 300 F make settings easy and comply with local ordinances.

NEW STEAM PRESSURE CONTROL

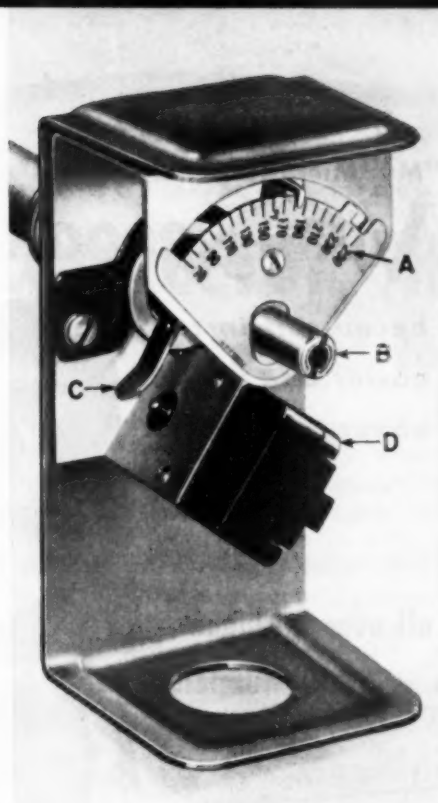
This new G-E control can be mounted and adjusted in a matter of minutes! Scales are easy to read and adjustments are simple. Dust-tight cover minimizes failure. There's plenty of room for wiring. It can either be used to maintain steam pressure or to operate as a safety limit.

For further information on G-E Limit Controls, contact your local G-E Apparatus Sales Office or write for Bulletins GEC-668, 669, 670, Section 740-25, General Electric Co., Schenectady 5, N. Y. *Registered trade-mark of General Electric Company

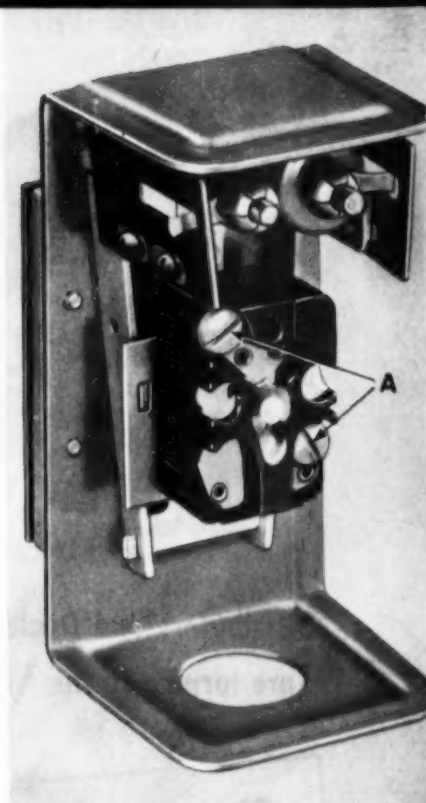
GENERAL  **ELECTRIC**



FOR WARM-AIR SYSTEMS, this control can be mounted on gravity or pipeless furnaces. Easy-to-read dial (A) makes settings simple. Guard (B) protects bimetallic helix from damage. Opening (C) takes standard or BX fittings. (D) Switchette.



FOR HOT WATER SYSTEMS, this new G-E immersion temperature control operates on any domestic gravity or forced hot water pipe. Indicating dial (A) shows through window in cover. Setting screw (B) protrudes for simple adjustment. Helix arm (C) actuates switch. (D) Switchette.



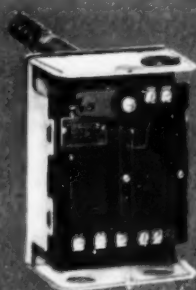
FOR STEAM SYSTEMS, this new G-E steam pressure control can be mounted on top of regular-style boiler or completely enclosed in new-type. Terminal screws (A) and mounting screws on switchette are easily accessible.

EASY TO SERVICE!

heat interchangeable with other makes



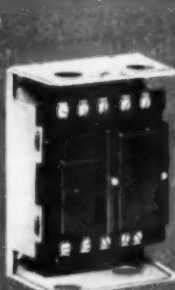
Thermostat



Limit Switch



Flame Detector



Master Control



Transformer Relay



Fan & Limit Switch



Temperature Limit Control



Water Immersion Control



Steam Pressure Control



OIL BURNER CONTROLS

The Appliance Control Department of General Electric is devoted exclusively to developing and producing a complete line of controls for appliance and oil-heating manufacturers.



"My Michigan distributors and dealers like the **Viking '2300' HUMIDIFIER**

*because it installs
easier and it's just
about Fool-Proof."*

says JOHN CARMAN
Earnest Viking Representative



**Distributors and Dealers all over Michigan
are turning to the Viking '2300' Humidifier**



**ERNEST H. BUCKERT, General Roofing Co., Inc.,
4611 Berkshire, Detroit 24, Mich.**

"It's easy to make money by handling the Viking '2300' Humidifier. Installation costs next to nothing because it takes only one man to install. You can be mighty sure I like that."



**MY WAREHOUSE COSTS ARE
CUT TO THE BONE**

**FRANK CHAMBERS,
Superior Safety Furnace Pipe Co.,
5820 Forsythe Ave., Detroit 2, Mich.**

"The Viking '2300' cuts my warehouse costs to rock bottom. Because only one style fits all furnaces, we've been able to build a money-making business in humidifiers at a rock-bottom inventory cost. You can be mighty sure I appreciate not having to stock a lot of models and sizes."

CHARLES M. CROSS,

**All Season Heating & Cooling Co.,
25123 Plymouth Rd., Detroit 28, Mich.**

"My customers are always pleased with the '2300'. Once it's installed they don't have to call back for service, and you can bet not having call-backs sure chops service expenses. You can't beat a Viking '2300' for trouble-free service."



**CHAS. A. BUTTERFIELD, Home Improvement Service,
2899 W. Grand Blvd., Detroit 2, Mich.**

"For a quick, money-making installation job a Viking '2300' is the last word. Completely packaged, with everything included, it makes for a fast 20-minute installation job. This keeps the house neat and clean at all times while the work is going on."

R

HEALTH BENEFITS OF VIKING HUMIDIFICATION

Humidity that is too high or too low "feeds" germs. With a Viking '2300' Humidifier you get just the right amount of moisture in the air to kill these germs. Proper humidification is a simple inexpensive way of stopping the spread of diseases like flu and pneumonia. It also helps relieve the discomfort of the common cold. Viking humidification is good for health as well as for comfort reasons.



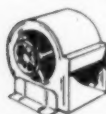
ATTIC FANS



BLOWER WHEELS



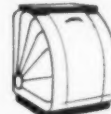
WINDOW FANS



BLOWER ASSEMBLIES



HUMIDIFIERS



PACKAGE BLOWERS

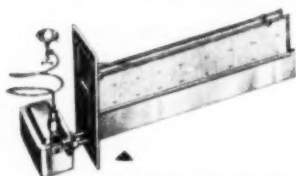


Tell 'em the facts.....and you'll find CONVECTOR HUMIDIFIERS Easiest to Sell!

Furnaces not only do a better heating job, but they distribute necessary water vapor more efficiently when a Maid-O'-Mist Convector Humidifier is installed. Unlike ordinary humidifiers, this new type does not block the flow of warm air thru the plenum. Individual $\frac{3}{8}$ " copper trough with patented evaporator pads permit unrestricted flow of air. Actually, this design gives the greater evaporating area necessary in modern short cycle heating. The entire unit is made of non-corrosive metals — copper and brass — can be installed simply by cutting one opening in the plenum.

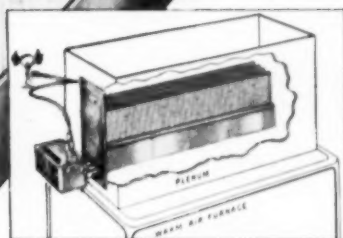
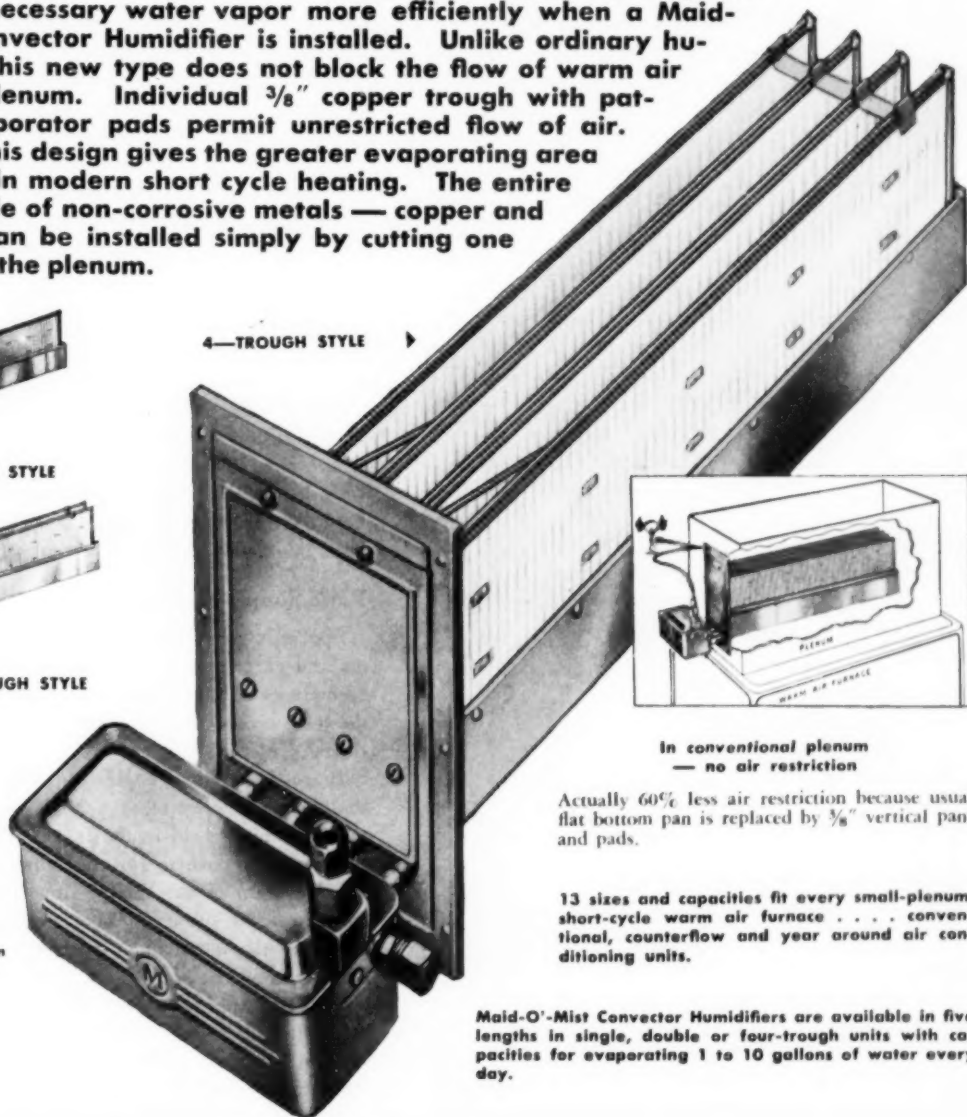


1—TROUGH STYLE



2—TROUGH STYLE

4—TROUGH STYLE



In conventional plenum
— no air restriction

Actually 60% less air restriction because usual flat bottom pan is replaced by $\frac{3}{8}$ " vertical pans and pads.

13 sizes and capacities fit every small-plenum, short-cycle warm air furnace . . . conventional, counterflow and year around air conditioning units.

Maid-O'-Mist Convector Humidifiers are available in five lengths in single, double or four-trough units with capacities for evaporating 1 to 10 gallons of water every day.

60%

less air restriction in plenum

30%

more evaporating area

50%

less installation time



AUTOMATIC HUMIDIFIERS AUTO-VENTS
WATER LINE CONTROLS . HEATING SPECIALTIES

MAID-O'-MIST, Inc.

3217 NORTH PULASKI ROAD . CHICAGO 41, ILL.

Laundry Agencies —

A Market for Sheet Metal Fixtures

... such as the rack for holding bundles of men's ironed shirts, described here in detail

By Ernest E. Zideck
Sheet Metal Consulting Engineer

COMMERCIAL LAUNDRIES collect wash from numerous small shops and stores and deliver it back to them ready for the customer. These small laundry agencies are a good market for the sheet metal man. Many of them, in the past poorly equipped and serviced, are now being modernized by larger laundries which are putting their own personnel in charge and ordering new equipment.

One problem in the past has been the storing and handling of bundles of men's dress and summer shirts — which may constitute over half of the laundry handled. Bundles delivered by the trucks often have been stacked atop one another on tables or makeshift counters or shelves where they are hard to sort out for the individual customer. Excessive handling of these packages has resulted in the ironed goods losing their shape. Therefore, laundries are on the lookout for devices which will help them solve the problem of storing and distributing such bundles efficiently.

Rack Simplifies Distribution

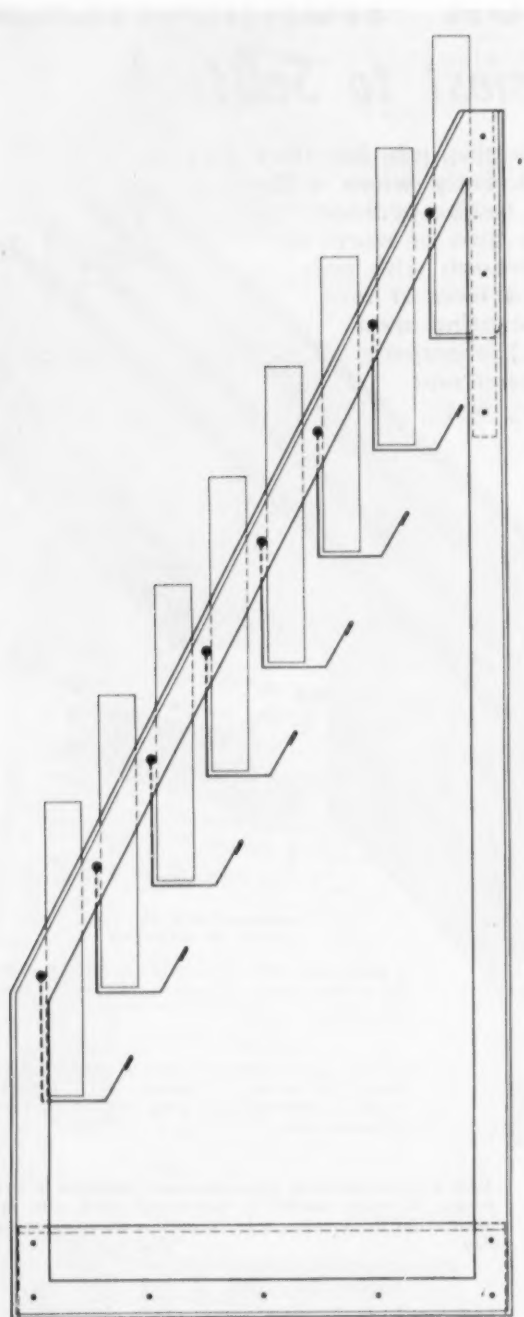
Specially designed stainless steel or aluminum counters and garment storing fixtures have been making their appearance in the modernized laundry agencies, of which the most conspicuous is a rack for holding men's ironed shirts.

It consists of two angle iron frames, connected horizontally by a series of vertical sheet metal shelves hanging from pipes held in the frames by pipe caps. These shelves form pockets for the bundles. Fig. 1 shows a side elevation of the rack. This particular fixture was made to order, to occupy about 9 sq ft of floor area. To facilitate the attendant's reaching the two rows of bundles, the rack had to be narrow at its base. Accordingly, the fixture shown is 26 in. wide at its base, 51 in. long, and 5 ft high. It will hold, without crowding, 40 bundles of men's ironed shirts.

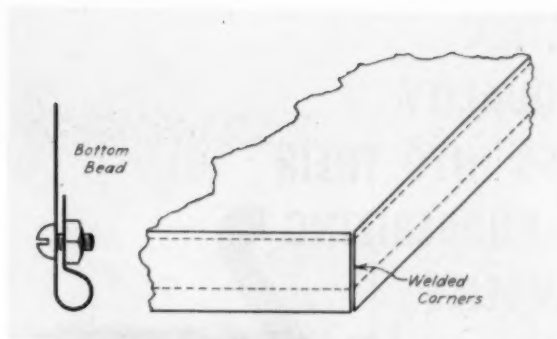
As can be seen in Fig. 1, each bundle protrudes a distance above the other and its face, containing the laundry list, is exposed for easy identification. The shelves or pockets were made to accommodate bundles of $2\frac{1}{4}$ in. maximum thickness.

Assembly by Bolting and Welding

This rack was constructed in a sheet metal shop to specifications furnished by the laundry. Conservation



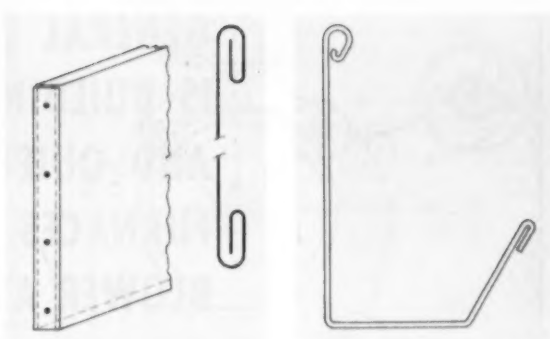
1 THIS RACK for holding men's ironed shirts (side elevation) consists of two angle iron frames connected horizontally by a series of vertical sheet metal shelves. The arrangement facilitates the attendant's reaching the top row of bundles



2 IN THE BASE of the rack, only the corners are welded, the main portion being bolted to the angle iron frames. A 1 in. margin (shown at left) is turned inward, preventing scratching of the floor

of material and practicability and ease of assembly were achieved through the use of bolts and threaded and capped pipe supports. The two side frames are 3/16 by 1 1/2 by 1 1/2 in. angle iron. They are welded and finished for exterior smoothness and appearance. Another welded part is the base, seen in Fig. 2. Here only the corners are welded, as the 4 in. high, 26 in. wide and 48 in. long portion is held to the angle iron frames by bolts. The base is made of 0.042 sheet aluminum or equivalent stainless steel sheared 36 by 58 in. A 1 in. wide margin is turned inward, bead-like, (Fig. 2, left). The radial formation reinforces the metal and prevents scratching of the floor. It also receives and holds tight the bolt nuts shown in the view (Fig. 2).

Another sheet metal part made of that same thickness of material is the rear panel, Fig. 3. It is reinforced



3 THE REAR PANEL is reinforced in its two long sides by the formation shown in the section at right, and is flanged laterally as shown at left

4 THE SHELF or pocket can be fabricated as shown, of 0.035 aluminum sheet or equivalent stainless steel

in its two long sides by the formation shown in the section at right, and is flanged laterally as shown at left. The flanges are bolted to the angle iron frames. The shelf or pocket can be fabricated as outlined in Fig. 4, of 0.035 aluminum sheet or equivalent stainless steel, sheared 15 in. wide by 48 in. long. Its bead formation was made step by step in the brake and pressed down over a length of 1/4 in. standard pipe. The metal turned inward rests against the pipe and holds it tight. When inserted by its threaded ends through the angle iron frames and capped, the threading cap forces the metal edge of the pocket against the angle iron frames, thus holding the shelf in position. The eight capped pipes provide the horizontal support for the cabinet.

This rack is one of a number of practical uses for stainless steel and aluminum fixtures in these stores.

CONVERT FROM GRAVITY —

(Continued from page 67)

Gravity Supply System Used for Return

Two modern high wall supply registers are located in the sun parlor, the conditioned air being discharged out along the glass doors. The old gravity supply grille located near the floor level is now the return air opening. It was decided that utilizing the old grille would be preferable to making a new opening in the floor or base-board for the return.

In another instance, the former gravity supply grille is used for return near a stairway (Fig. 5). The supply register was cut into the wooden base of the stairway balcony. Note that every effort has been made to harmonize the necessary supply openings with the existing ornamental design.

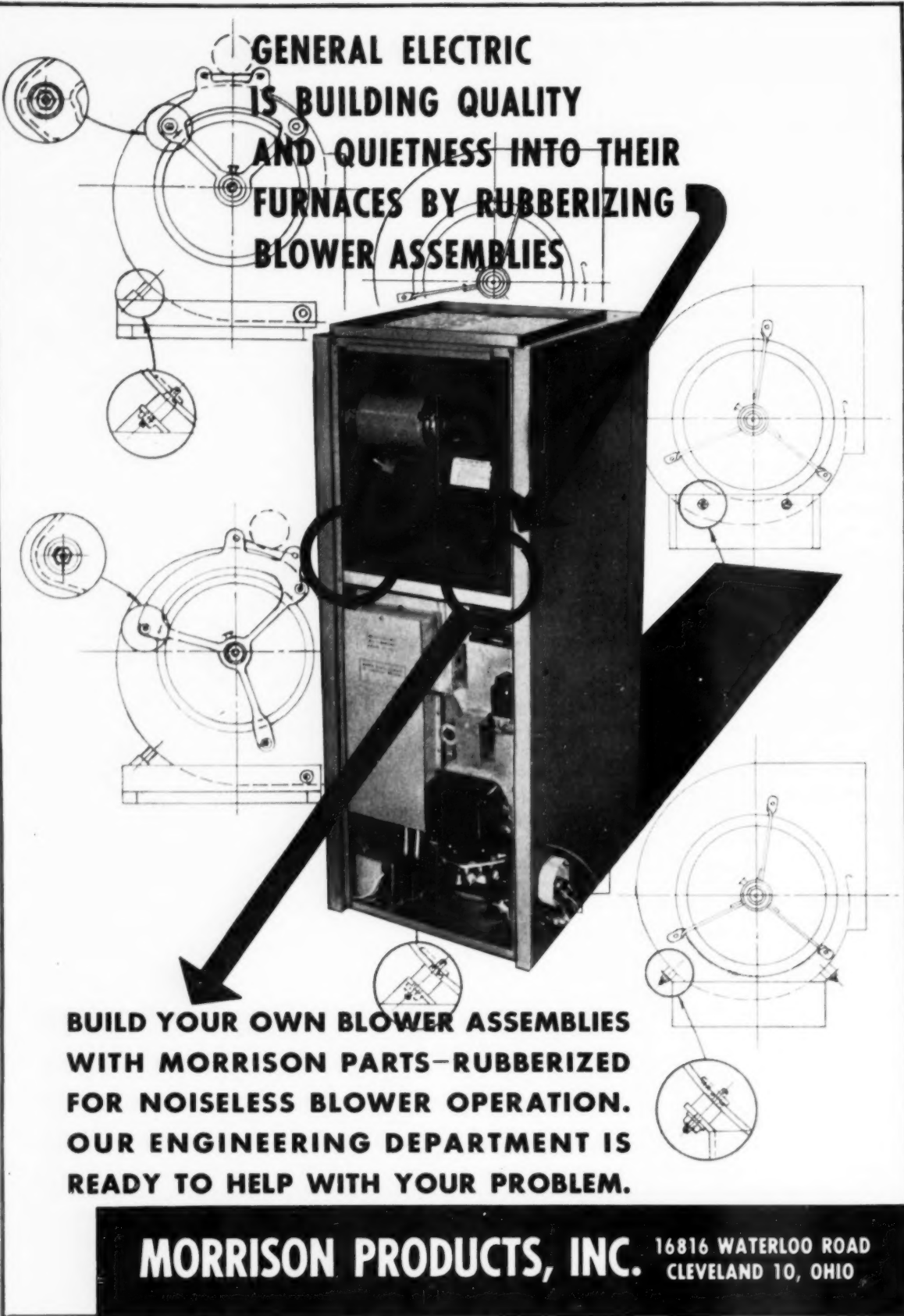
To reduce transmission of operating noise, round ducts were connected to new return plenum chambers and fastened to the conditioners with flexible duct connections

(Fig. 6). The small round duct running horizontally is the flue pipe; above this is another supply duct cut into one of the spaces available between the partition walls.

Recommendations Have Built Business

This year 'round system has operated so satisfactorily during the past heating season and the recent hot, humid weather in New Orleans that some out-of-state guests have written Mr. Weil inquiring whether or not the contractor would be willing to make a similar installation in their home. Mr. Burguières says all of his work originates in this way — from recommendations of satisfied customers. He has installed more than 400 year 'round systems in the last five years.

For Ernest Engineering, Inc., most installations in new buildings are done during the winter months. This amounts to about 25 per cent of the annual volume. The remaining 75 per cent is modernization work, most of which takes place after the heating season is over and before the next one begins.



**GENERAL ELECTRIC
IS BUILDING QUALITY
AND QUIETNESS INTO THEIR
FURNACES BY RUBBERIZING
BLOWER ASSEMBLIES**

**BUILD YOUR OWN BLOWER ASSEMBLIES
WITH MORRISON PARTS—RUBBERIZED
FOR NOISELESS BLOWER OPERATION.
OUR ENGINEERING DEPARTMENT IS
READY TO HELP WITH YOUR PROBLEM.**

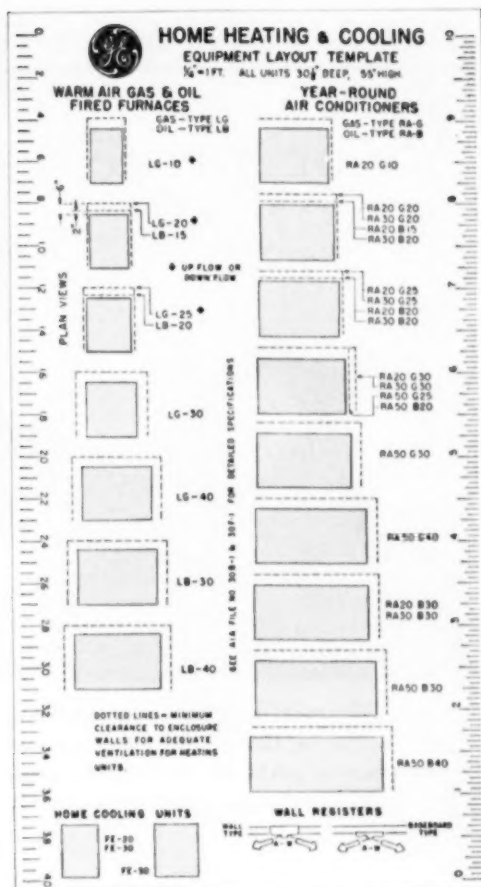
MORRISON PRODUCTS, INC.

**16816 WATERLOO ROAD
CLEVELAND 10, OHIO**



TO USE THE layout template shown (right), the dealer follows five steps:

- 1 He determines the required heating and/or cooling load.
- 2 He selects the unit model.
- 3 He positions the cutout of the selected model over the space where the unit will be installed on the floor plan so that proper clearances for the unit, represented by the broken lines on the template, are provided.
- 4 He draws an outline of the unit with pencil against the edge of the cutout and perpendicular to the paper. (Pencil lead width is allowed for in the cutout design).
- 5 If he wishes to provide space for future addition of a cooling unit after he outlines a furnace, he overlays the year 'round unit cutout and outlines additional space for the cooling unit with a broken line.



Template Helps Dealer Lay Out Year 'Round Systems

By **Bruce H. McLain**
Application Engineer
General Electric Co.

... reducing the possibility of error
when unit sizes are scaled to a floor plan

SINCE SPACE is at a premium in modern buildings, accuracy is extremely important in determining the location and physical space requirements of an air conditioning plant. A recently developed equipment layout template can be used by the dealer to perform his equipment layout job accurately, without requiring a complete drafting procedure.

In the days of rambling building construction, high ceilings, large utility rooms, and unfinished basements, a little "on the spot engineering" in the positioning of conditioning equipment was all that was necessary. Floor space was not at a high premium.

However, a complete revolution has taken place in

(Please turn to page 140)

Minor Breaches Don't Cancel Contract

By Albert W. Gray



In many cases, a dealer can sue to collect his fees even though his contract with the customer is partially unfulfilled, since partial breaches do not necessarily cancel contracts

A CONTRACT was made by the owner of a retail bakery in a northern state for the installation of a year 'round air conditioning unit for \$2260. On the first test run, the air came through the register with too great force. The defect however was promptly remedied. Another difficulty that followed during the winter was that the system failed to eliminate vapor condensation on the display windows. Certain adjustments were made and the problem was overcome, except during the morning hours of the coldest days. This problem also was eventually solved.

Some time after the unit had been in operation, the dealer received a letter from the owner ordering the removal of the unit on the grounds that it failed to comply with the contract. In the meantime, however, the dealer had filed a lien for the balance due under his contract.

The foreclosure action brought by the dealer was finally decided in his favor by the supreme court of that state. The bakery owner in his defense to that action made no claim for damages, but based his defense entirely on the contention that the dealer had warranted this unit would keep the show windows free of frost and moisture and that the installation would be completed within a reasonable time. Both of these warranties the owner maintained had been broken and as a consequence

the contract was rescinded and the owner relieved of liability.

Partial Failure Does Not End Contract

Attempts made by dissatisfied owners to defeat the recovery by heating and air conditioning dealers under installation contracts suggests a generally misplaced confidence in this character of a defense.

"It does not follow in every case of mutual and dependent covenants that upon the failure of one party to perform his covenant the other party will be exonerated or excused from performing his covenant. Before partial failure of performance of one party will excuse the other from performing his contract or give him a right of rescission, the act failed to be performed must go to the root of the matter," was the statement of this principle of law by another state's supreme court in its decision on a similar case.

Before an owner can avail himself of a right to rescind on the failure of a contractor to fulfill the contract, the failure of performance must be one that defeats the very object of the agreement — it must go to the "root" of the contract.

"It is a clearly recognized principle," said an English court over a century and a quarter ago, "that if there is only a partial failure of performance by one party to a contract for which there may be a compensation in damages, the contract is not put an end to."

Breach Must Be a Major One

The reluctance of courts to relieve parties of their obligations under a contract when once it is made on the ground that one of them has failed in the performance of a minor feature of the contract, appeared clearly in a case involving an employment contract of a mechanic for heating and refrigerating contracts by a contracting firm.

This employment contract provided, "In consideration of services rendered and to be rendered we hereby agree to give you 10 per cent of the net profits on contract business done by this organization. This agreement is to remain in force as long as you remain in the service of this organization. It is further understood that in the event we do not have sufficient work which will enable us to pay a fair living wage, you will be at liberty to work for other organizations; but we to have the first call on your services. In making this agreement we have in mind the future possibility of you becoming a vital factor

Albert W. Gray, author of this article, has had twenty years experience as an attorney in the courts of New York City. He has written widely on legal matters and is the author of "The Family Legal Adviser."



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and shareholder in this organization."

This agreement continued for seven years and during that time this employee worked for others when not needed by this employer, but always with the understanding that the right of this employer to his services had precedence.

Mere Notice Cannot Rescind Contract

When at the end of that period he asked for an accounting of the profits to which he claimed he was entitled under this agreement he was met by the assertion that six years before he had been given notice by this employer that,

"We are cancelling all agreements made with our erecting force applying to profit sharing and continuous employment. This is made necessary due to the uncertainty of business and we want you to feel free to accept employment elsewhere if necessary."

The supreme court of the state involved, in holding that there had been no rescission of this contract and that this employee was entitled to an accounting and the payment of the agreed 10 per cent of the profits, said of these principles of law governing contracts,

"If either party expresses an intention to abandon the performance of a contract and the other party fails to object there may be circumstances justifying the inference that the other party had assented thereto. Even circumstances of a negative character such as a failure of both parties to take any steps looking to the enforcement of the contract may sometimes amount to a mutual assent to rescind it. But failure to object to a repudiation of a contract is not in itself a manifestation of assent to its rescission.

"A mere notice cannot have the effect of rescinding a contract unless the party giving the notice is entitled to rescind. To establish the rescission of a contract by implication, the acts relied upon must be unequivocal and inconsistent with the existence of the contract.

"The general rule has been well established that if there has been a material breach of contract and the injury caused thereby is irreparable or if the damages that might be awarded would be impossible or difficult to determine or inadequate, the injured party may invoke the aid of equity to obtain a rescission.

"The court however will not grant a rescission for casual or unimportant breaches but only for a substantial breach tending to defeat the object of the contract."

Can't Rescind Contract and Collect Damages

The refusal of an owner to pay under an installation contract is generally grounded either on the claim that the contract has been rescinded, as in the first case, or on a claim for damages for a breach of warranty.

In either defense, the demand for a cancellation of the contract or for damages is an election by the owner. He may not both eat his cake and have it. Damages must rest upon a breach of the contract but if the contract is rescinded there is no contract, hence no breach and no damages.

"Rescission and an action for damages are inconsistent remedies and cannot coexist, as one rests upon the avoidance of a contract and the other upon its affirmance," asserted a federal appellate court in a recent decision involving these contradictory claims of rescission and damages.

"When one takes legal steps to enforce a contract, this is a conclusive election not to rescind," asserted that court. "The converse is also true, so that when a party commences an action to rescind he has made his election and cannot maintain an action on the contract.

"Generally speaking, the effect of rescission is to extinguish the contract. The contract is annihilated so effectually that in the contemplation of the law it has never had any existence even for the purpose of being broken.

"Accordingly it has been said that a lawful rescission of an agreement puts an end to it for all purposes, not only to preclude the recovery of the contract price but also to prevent the recovery of damages for breach of contract."

On the basis of these authorities, the supreme court in the first case sustained a judgment in favor of the dealer against the owner of the bakery for the amount agreed upon in the installation contract, saying,

"The rule is well established that only a material breach of a contract or a substantial failure in its performance justifies a party thereto in rescinding it. It is obvious here that under this rule the owner was not justified in rescinding the contract after the contractor had substantially performed his part thereof and only minor adjustments remained necessary to make the system work satisfactorily."

[Note: While this discussion applies to actual cases, it should be remembered that legal rules vary in different states.]

UNIFORM STANDARDS FOR MACHINE GUARDING NEEDED

To PROMOTE safety, uniform standards for machinery guarding are needed, the 41st National Safety Congress was told last month.

Floyd E. Frazier, industrial division director of the accident and fire prevention department, National Association of Mutual Casualty Cos., said that "in a study of one particular industry it was found that although machinery was the source of only about 15 per cent of the total injuries, those cases accounted for more than 50 per cent of the total losses." He explained that many machinery manufacturers feel guards cannot be included as standard equipment because of conflicting requirements in various states.

Another speaker, Henry G. Lamb, American Standards Association, told the meeting about a new safety code for portable wood ladders of the type that might be used in roofing and other sheet metal work. Minimum overlap of two ladder sections must be at least 3 ft for a 28 ft ladder. He pointed out that a wooden ladder should be purchased unpainted so that the cracks, checks, pitch pockets and other defects can be seen.

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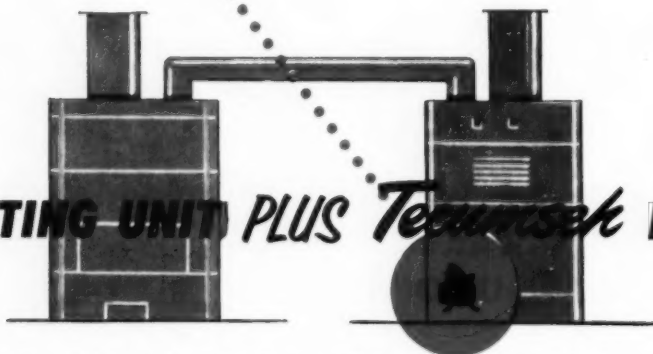
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CONDITIONING HOME —

(Continued from page 59)

in heating practice. With this method, it is assumed that outside air infiltrates each room in proportion to the lineal feet of window and door cracks. The total amount of infiltration is then divided in half since it is considered that the air will enter one side of a building and leave through the other side in like amount. With this method, the unconditioned air is considered to enter the conditioned space directly. It must, therefore, be added to each room load.

Another way to estimate outside air is to take an arbitrary number of air changes in the house, one per hour being considered adequate in the average home. The air is introduced directly to the conditioner through an outside air connection. In this way, it is treated before it gets to the conditioned areas. This air change method was used in the sample load calculation, the amount of air introduced being about 185 cfm.

A final source of heat considered in the cooling estimate, which does not appear in the room by room calculation, is the heat of the conditioner blower. The motor of this blower is usually in the air stream so that its total input must be absorbed by the conditioned air. Motor heat may be estimated at the rate of 3000 Btu per hr per hp.

Table 2 shows a room by room summary of the house cooling and heating requirements. The difference in the totals of columns *A* and *B* represent the effect of insulation in the wall stud spaces and awnings on the west windows. The difference between the totals in columns *C* and *D* represents the effect of stud space insulation, storm windows, and storm doors. The reduction in sensible cooling requirements is about 24 per cent, whereas the reduction in the heating load is about 35 per cent. Although these savings appear to be substantial, their true dollar worth may be found only by making a cost study in which savings in initial and operating costs of the cooling and heating equipment are bal-

anced against the cost of insulating, buying awnings, storm windows, etc. The loads shown in columns *A* and *C* will be used for the purposes of selecting equipment, since these apply to the house as it actually exists.

Separate Units to be Selected

Having calculated the loads, the next problem is the selection of the heating and cooling equipment. Combination year 'round units in one package are available. For the purpose of this example, however, we shall select separate heating and cooling units, using the heating unit blower to circulate air both summer and winter.

To handle the heating load of 86,721 Btu per hr we shall select a gas fired, warm air furnace having a register output of 91,800 Btu per hr. This is somewhat higher than is actually needed, but it happens to be the nearest available size in the make chosen. The blower in this unit has a 1/6 hp motor which will handle between 1050 and 1320 cfm against a static pressure of 0.20 in. of water.

The cooling load as shown in column *A* of Table 2 is 30,818 Btu per hr. This is sensible cooling only. It will be noticed that latent cooling (moisture removal) was not considered. The only sources of moisture we can definitely account for are the people and the outside air (three people and 185 cfm of outside air). The moisture from these sources is small, amounting to only 3400 Btu per hr which would make the total load 34,218 Btu per hr. Because the latent load may be greater than the calculation would show (by reason of doors being opened frequently, moisture migration through walls, excess infiltration, cooking, laundering, etc.), it is recommended that cooling units be selected by matching sensible capacity to sensible load. Standard residential conditioners will almost always have sufficient latent capacity if the sensible capacity is adequate. If the total calculated load (which might be low because of an underestimated latent load) were used as the selection basis, the unit might be short of sensible capacity.

Table 1—Typical Form Used for Calculating Heat Gain for Each Room. Figures Used to Calculate Cooling Load with no Wall Insulation

Space	Part of Structure	Net Area (sq ft)	U Value	Temp. Diff. F	Btu per hr	Remarks
Dining-Kitchen Area	E. Wall	64	0.21	15	202	Shaded by adj. bldg.
	E. Glass	9	1.13	15	153	Inside blind
	N. Wall	115	0.21	15	365	
	N. Glass	51	1.13	15	865	Inside blind
	W. Wall	64	0.21	31	416	
	W. Glass	9	1.13	102	1035	Inside blind
	Ceiling-Roof	186	0.14	49	1275	Flat—no attic
	Floor	186	0.34	10	632	
Conduction and Solar load					4941	

Table 2—Room by Room Load Summary

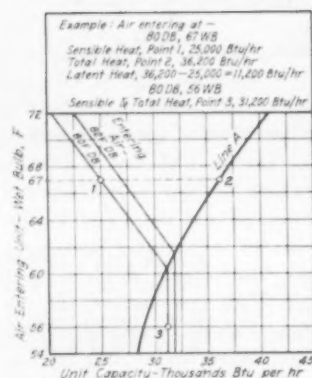
Source of Load	Cooling Load, Btu per hr		Heating Load, Btu per hr	
	A	B	C	D
N.E. bedroom	1518	1178	5859	5054
N.W. bedroom	5576	2248	6829	5646
S.W. bedroom	2865	2150	9265	5583
Hall	250	250	408	408
Bathroom	472	558	1826	1008
Stairwell (second floor)	813	580	5354	1887
Dining-kitchen	4941	3917	12,386	7524
Library	5090	879	3270	1605
Half-bath	270	218	1127	609
Hall	682	611	1794	743
Stairwell (first floor)	504	283	1692	638
Living room	10,298	7128	9975	6113
Basement	Not cooled	Not cooled	13,015	8062
Fan motor	750	750		
Outside air at one change per hr	2989	2989	15,941	15,941
Total sensible cooling or heating req'd.	30,818	23,559	86,721	56,821

In accordance with the above discussion, our problem is to select an air conditioner that has a sensible capacity of 30,813 Btu per hr. Let us examine Fig. 5, which shows performance characteristics of a typical 3 hp air conditioner. This appears, at first glance, to be the machine size we will need.

It will be recalled that we assumed our inside design temperatures to be 80 F dry bulb, 67 F wet bulb. Suppose, then, that we enter Fig. 5 at 67 F and find that the air conditioner has a sensible capacity of 25,000 Btu per hr, a total capacity of 36,200 Btu per hr, and a latent capacity of 11,200 Btu per hr. It will be noted that the sensible capacity is less than we require but that the latent capacity is greater than we require. Because the machine has more latent capacity than we require, it will remove moisture from the air faster than the moisture sources are supplying it. This means that the wet bulb temperature will begin to drop. It will fall until the rate at which moisture is supplied is in balance with the rate at which it is removed. Notice on Fig. 5 that for a given dry bulb temperature, a lower entering wet

bulb temperature decreases total and latent machine capacity but increases sensible capacity. At 62½ F wet bulb we find that sensible capacity has risen to 29,300 Btu per hr but that total capacity has fallen to 32,500 Btu per hr and latent capacity to 3200 Btu per hr. This condition of operation would just about balance our calculated sensible and latent loads.

If our latent load should actually be greater than the 3400 Btu per hr calculated, and the machine balanced out at 67 F wet bulb with a sensible capacity of only 25,000 Btu per hr as compared with the 29,300 Btu per hr sensible capacity we found at the lower wet bulb temperature of 62½ F, we would still consider the 3 hp unit a good match for our 30,813 Btu per hr sensible load. This is because undersizing within limits is more desirable from a comfort standpoint than severe oversizing. If we did not use the 3 hp unit we would have to go to a 5 hp unit. This would be so much too large that it would cycle on and off frequently even at peak load. When it was off there would be no means for keeping the humidity from rising rapidly. The smaller unit, on the other hand,



5 HOW DRY AND WET BULB temperatures of entering air affect the performance of a 3 hp air conditioner. Intersections of wet and dry bulb lines to the left of line A represent sensible heat removed

would be kept running almost constantly at peak loads. Since humidity would be kept well under control, some dry bulb slip which might occur due to short capacity would not be objectionable. The smaller unit also, of course, would have an advantage in first and operating costs.

EVAPORATIVE COOLERS —

(Continued from page 79)

complicated duct run, by the total equivalent length of that duct to determine the friction loss per unit of length to be used. The remaining ducts are then sized to have the same resistance value per unit length.

The pressure loss per 100 ft of duct, including equivalent length of all fittings, may be taken from friction loss charts available in many engineering handbooks and textbooks on air flow. In general practice, a friction loss of approximately 0.20 in. is used for residential work. (While this is higher than that encountered in some forced warm air heating systems, it must be remembered that many evaporative cooling systems operate at 20 or more air changes per hr which would result

in the use of excessively large ducts if a lower frictional resistance value were used.) This method of determining duct sizes will result in the same friction per unit length for short duct runs handling smaller quantities of air as exists in the longest duct. Air flow in the shorter runs should be adjusted by use of dampers.

Sizing based on Velocities

In the velocity method of sizing a duct system, selected velocities are arbitrarily assigned to the various sections of the duct system. Generally, the highest air velocities are chosen at the cooler outlet and progressively lower velocities assigned as various branch ducts are taken off the main duct. The lowest velocity is at the end of the duct leading into the conditioned space. Since the quantities of air to be delivered

through each section are known, the cross-sectional area of each section of duct can be determined on this basis of assumed velocities. The pressure or friction loss of each section can then be calculated separately and the total pressure against which the cooler must operate obtained by adding the individual losses of the various sections which make up the longest equivalent length of duct.

Common velocities used in residences are 1600 fpm for the trunk duct, 1200 fpm for branch ducts and 1000 fpm at the register. This method can produce results just as accurate as the equal friction method if care is used in choosing the proper velocities to approach equal friction in all ducts.

A combination of the two methods is often used where there are a number of branch ducts by employ-

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ing the equal friction method to make the total pressure loss in each branch duct equal to the pressure loss in the remaining section of the main duct. This combination method is satisfactory provided the velocity in the branch duct is not increased beyond a point consistent with good practice from the standpoint of noise. If excessive velocities result from the use of this method of design, a damper may be placed in the entrance to each branch duct to control the flow of air and larger ducts may be used in the branch line to reduce the velocity of the air.

Cooler for Specific Application

Fig. 3 shows the distribution system for the evaporative cooler installation shown in Fig. 1. It is connected to a forced warm air heating system; thus the same duct system is utilized for both cooling and heating. Since the evaporative cooler usually handles at least five times as much air as is delivered by the furnace blower, the ducts and registers are sized to fit the cooling requirements. The trunk duct is run through the hall which has a furred down ceiling. The width of the hall and the maximum furring possible limit the size of the main supply duct.

To select the proper evaporative cooler to meet the needs of the house shown in Fig. 1, it was necessary to estimate the rate of air change, which was found to be one every two and one-half minutes. Although the cooler specified is a 4500 cfm unit, the actual air delivery, because of the frictional resistance of the ducts and registers, is approximately 3600 cfm (an industry practice is to rate the cooler at its free air delivery). Ductwork for such applications is usually fabricated from 26 gage or heavier galvanized steel diagonally broken and insulated with 1 in. of insulation having a coefficient of between 0.20 and 0.27 Btu.

Adjustable Registers Used

Registers for evaporative cooler installations are usually 3 in. deep and of the multi-louver type. The vertical multi-louvers are set on 1 in. centers to minimize friction re-

sistance. The louvers are arranged so that the left half of the register adjusts from the left towards the center and the right half adjusts from the right towards the center. Each half can be opened or closed independently, so that all of the register may be used for cooling while only half of the register is used for heating. Dual section dampers, another type, are used in combination cooling and heating systems. The louver assembly is divided into two independent sections, one above the other. During the heating season when the air delivery is reduced, the design velocity and throw can be maintained by closing one section of the louvers.

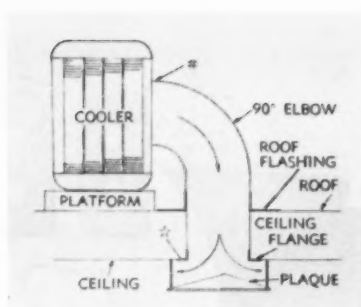
Slide dampers are usually used in the trunk duct at the cooler outlet and furnace plenum. During the summer, the furnace damper is closed and the cooler damper opened. In winter the cooler damper is closed, the furnace damper opened.

The Federal Housing Administration in its statement of minimum property requirements for the Phoenix and Albuquerque insuring offices, points out that in areas designated by the chief underwriter, cooling ducts and registers are to be provided to each main room and that registers for evaporative cooling systems shall be designed to provide a gross area equal to not less than 0.0055 times the floor area of the room served by the register.

Exhaust Must Equal Supply

A consideration that is often overlooked in installing an evaporative cooling system is the need for exhausting the same amount of air as is supplied. If the air is not removed as fast as it is introduced air pressure will build to a point where there will be an almost complete stoppage of air flow. There will also be a noticeable increase in relative humidity.

It is good practice to make the exhaust opening at least three times the size of the discharge opening of the cooler. While windows and doors located at distance points may be used, a better method is to exhaust the spent air to the attic, thus forcing the hot air in the attic to



4 FOR MANY COMMERCIAL installations, the best location for the evaporative cooler is on the roof. A short sheet metal duct is usually connected to a ceiling plaque or diffuser

escape through louvers installed under the gables. This will reduce the air temperature of the attic and the heat gain of the house will be reduced.

It has been found that for many commercial installations, where the climate is hot and dry, the best location for the cooler will be on the roof, as shown in Fig. 4.

If a building is over 50 ft long, an exhaust fan should be used to aid the discharge of the air. Where unusually long rooms are involved it is advisable to install more than one unit spaced along the room to maintain a favorable velocity toward the exhaust opening.

In restaurant installations a good method is to exhaust the air through the kitchens where exhaust fans are usually located over the ranges to dissipate the heat and odors from this area. If extensive ductwork is required for commercial installations, the same engineering methods as are used in all ventilating work should be followed. However, if each cooler supplies only one outlet, it is not usually necessary to calculate the duct sizes by such methods. In these cases, the duct may be the same size as the cooler outlet if it is not over 25 ft long. For each additional 25 ft of duct, the cross sectional area of the duct should be increased 25 per cent.

Figs. 1 and 2 are courtesy International Metal Products Co.; Fig. 3, Goettl Bros. Metal Products, Inc.

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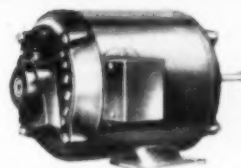
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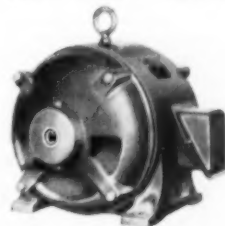
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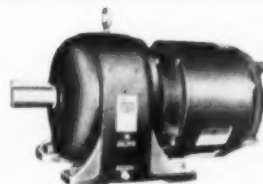
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J-Z Gas Fired FLOOR FURNACES are available in five conventional and short models with input ratings from 30,000 B.T.U./hr. They become a complete one-package heating unit when equipped with safety pilot and automatic temperature control. Small grille, high heat transfer.

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Series UHS Fan Type UNIT HEATERS are fully automatic and provide clean, safe and trouble free forced air heating. Heaters are for all gases and are equipped with positive automatic safety shut-off valves. Have B.T.U./hr. rating from 55,000.

CENTRAL GAS HEATERS

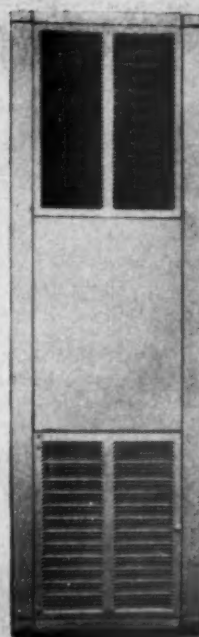
J-Z CENTRAL HEATING UNITS are compactly built, simple, efficient in operation and are available in Vertical or Horizontal type forced air models. Heaters can be installed in the basement, attic, service closet or utility room. The AF-110 may even be installed under the house if provisions are made for the draft diverter. For industrial applications, J-Z Central Heating Units can be installed on a shelf or balcony, as a suspended heater or as a duct heater. B.T.U./hr. ratings from 65,000.

WALL HEATERS

WH-25 Recessed Wall Heater fits between partitions on 16" stud centers. Barely 58" high. Available in standard or radiant styles. 25,000 B.T.U./hr. rating.

JOHN ZINK COMPANY

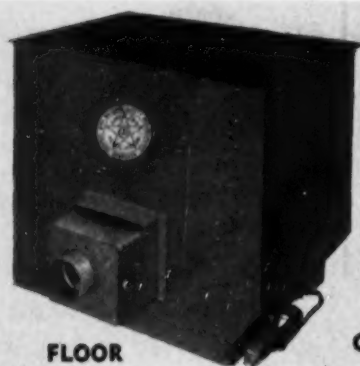
4401 SOUTH PEORIA • TULSA, OKLAHOMA



WALL HEATER



SUSPENDED UNIT HEATER



FLOOR FURNACE



CENTRAL GAS HEATER

✓ Check this **DIFFERENCE**
in all *Lamneck* Jobs



Installation by Clawson Service & Supply Co., Ironton, Ohio

**Always Uniform and
Handsome in appearance**

HOWARD E. CLAWSON
President
Clawson Service & Supply Co.



"I looked them all over before I decided to use Lamneck fittings. There were many reasons why I chose Lamneck, and not least among them was the fact that I found out I could always count on Lamneck to give me a sweet looking job every time."

Howard E. Clawson

P.S. Don't think appearance doesn't help in getting new business.

Here are more reasons why C & L Lamneck is preferred by leading warm air heating contractors: Less air resistance; less air leakage; material and labor savings up to 30%; easier job figuring; Snap-Tite Connectors for easier, quicker, better installations. These and other important reasons make it worth your while to investigate C & L Lamneck. Write for free catalog, or name of your nearest wholesaler to Clayton & Lambert Mfg. Co., 1701 Dixie Highway, Louisville, Ky.

Sold only thru Recognized Wholesalers

CLAYTON & LAMBERT



SERVICING FILTERS —

(Continued from page 61)

ing. Which type of filter is selected is determined by the service facilities available, in addition to other factors.

Filters — a Good Service Item

Many dealers who handle heating and/or air conditioning equipment have found that filters are excellent service items. It is frequent practice to handle filters along with several other service items, such as furnace humidifiers, fan belts, motors, and the various controls used on heating and air conditioning equipment. Filters have proven to be a valuable aid in giving the dealer a good opportunity to inspect the customer's equipment and to inform him of other items or services which he can use to advantage.

In carrying out this type of an operation, a dealer can make use of the disposable type of filter, the disposable media type, or the washable type. The usual practice is to set up a definite route to permit servicing the maximum number of customers on a trip to a given area. This can be readily accomplished when an agreement is made with various customers to service their filters on a definite time cycle. A file of cards (such as the one illustrated in Fig. 6) is a great asset. Service work done at the customer's home or place of business consists essentially of removing the dirty filters from the unit and installing the new filter. Installing new media in the replaceable media type and the cleaning and recharging of the washable type generally are done in the dealer's shop. If washable filters are used, it is a frequent practice to sell the customer two sets of filters so that one can be in use while the second is being serviced.

How Filters Are Cleaned

Typical equipment for cleaning filters is shown in Figs. 7 and 8. That shown in Fig. 7 consists of a tank in which a suitable cleaning solution can be placed. Generally, the cleaning operation is not started until enough dirty filters have been accumulated to permit doing the service job efficiently. The filters are agitated in the cleaning solution until the dirt load is removed. They are then rinsed and placed on a drain rack where they are allowed to drain before being either immersed in or sprayed with adhesive. A second piece of equipment which can be effectively used is illustrated in Fig. 8. The filters are first flushed out with hot water and then recharged with adhesive by means of a spray gun. The filter cleaning operation is greatly simplified by the use of a water soluble adhesive.

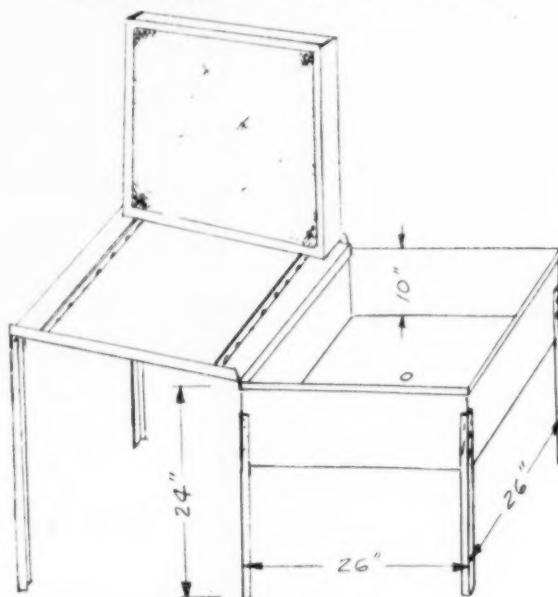
In many metropolitan areas, the volume of filter service business has become great enough so that large heating and sheet metal shops have set up separate departments for this purpose. Operations of this type have proven to be both profitable to the dealer and economical to the filter user.

Customer Jones Drug Store
Address 1263 Main Street

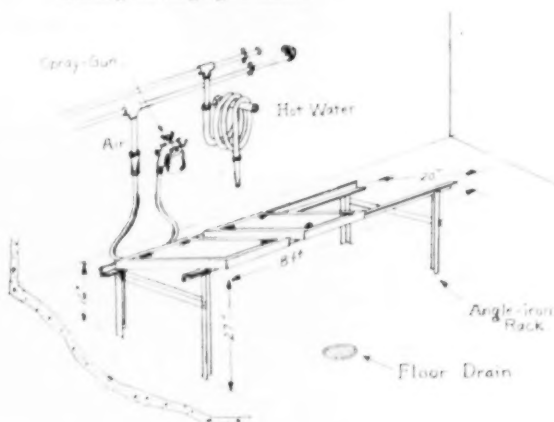
SERVICE RECORD AIR FILTERS

Type of Unit	ROGL 2000	Number of Units	2
Number of Filters	4	Size	16 x 20 x 1"
	Date	Type	Date
Installed	April 1, 1953	Changed	
Changed	May 1, 1953	Changed	
Changed	June 1, 1953	Changed	
Changed	July 1, 1953	Changed	
Changed		Remarks	Keep filters clean to assure good performance of units.
Changed			
Changed			
Changed			

6 FILE CARDS for filter service operations can be used in laying out routes for filter service trucks



7 TYPICAL FILTER washing and recharging tank. The same tank can be used for both operations, or a second compartment can be added for holding recharging adhesive



8 ALTERNATE equipment for cleaning and recharging washable filters. Details vary, depending on the size of the filter service department, the facilities available, and the characteristics of the filters to be serviced

How am I doin'? *Great!*



I'm selling not just one, but
THREE big markets with . . .

EUREKA

Williams Home Heating and Cooling

First market—rich and "wide open" for the EW dealer! Thanks to a flood of articles in the nation's biggest publications, those building or remodeling know year round air conditioning is now available. And thanks to Eureka Williams' powerful national advertising, prospects know EW now offers this 4-season comfort. AIR-O-MATIC Cooling teamed with OIL-O-MATIC or GAS-O-MATIC Heating meets their demand, gives you *double-the-profit!*

Second market—those prospects (building, remodeling or replacing heating in present homes) who *want* to add summer cooling but whose budgets are limited. Tell them this: install heating now, *add cooling later* when finances permit (possible only because EW heating and cooling units are independent units). Thus you "clinch" the sale of an OIL-O-MATIC or GAS-O-MATIC now, and you've got even greater profits to come with the AIR-O-MATIC!

Third market—summer air conditioning for America's 29,000,000 existing homes! A vast, ripe market if you have the right product—and the EW dealer does. Because AIR-O-MATIC can be added to any existing warm-air heating system, you can sell hundreds of homeowners on how easy, how inexpensive it is to own summer cooling. Yes, today's homes now offer the EW dealer a market that didn't exist 'til now!

CASH IN ON THESE **THREE** BIG MARKETS . . .

MAIL COUPON NOW FOR FRANCHISE FACTS



Williams Division

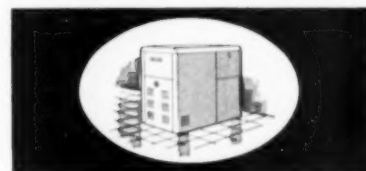
Eureka Williams Corporation • Bloomington, Illinois

In Canada: Williams Oil-O-Matic of Canada, Ltd., Guelph, Ontario

Better Products. Better Made *for better living!*

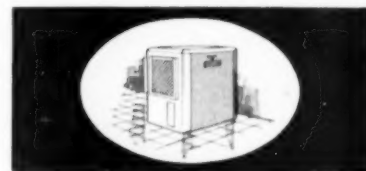
OIL-O-MATIC Home Heating

Complete line of Conversion Burners and Complete Units for homes of every size and type.



GAS-O-MATIC Home Heating

Complete line of Conversion Burners and Complete Units for homes of every size and type.



AIR-O-MATIC Home Cooling

Install with Oil-O-Matic, Gas-O-Matic or existing warm-air heating system to provide year round air conditioning at very low cost.

Williams Division—Eureka Williams Corporation
Bloomington, Illinois

Please send me full facts about new year round profit opportunities with the Eureka Williams Franchise.

NAME _____

FIRM _____

ADDRESS _____

CITY _____ STATE _____ AA-11

TABLE 1—Prices Charged by Typical Filter Service Department

No. Filters on Which Price is Based	Type of Location	†Cleaning Frequency	Person Removing and Installing Filter	No. Sets of Filters Owned by User	*Charge for Service per Cleaning per Unit	Main Factor in cost Range
2	Convenient	2 months	Filter service man	2	\$0.75-1.00	Distance from filter service department
24	Convenient	2 months	Filter service man	2	0.55-0.75	Distance from filter service department
100	Convenient	2 months	Filter service man	2	0.50	Distance from filter service department not too important
24	Inconvenient	2 months	Filter service man	2	0.60-0.80	Distance from shop and nature of inconvenience
24	Inconvenient, (hazardous)	2 months	Filter service man	2	0.80-1.25	Distance from shop, nature of inconvenience, insurance required
24	Convenient	2 months	Filter service man	24 hr. service	50% increase over two-set price	
24	Dock to dock delivery	2 months	Filter owner		0.50-0.75	Distance from filter service department
24	User ships to filter service department	2 months	Filter owner		0.45	

*Prices apply to all common sizes.

†Two month frequency arbitrarily set to simplify presentation.

The cost charged the filter user is based on a number of factors. Table 1 shows prices charged by a typical filter service department for a number of typical situations. The price is dependent upon such factors as the number of filters to be serviced, how conveniently the filters are located, the frequency of the cleaning, whether or not the user removes and installs the filter or depends on the filter service operator to do this, and the number of filter sets in operation.

TRUCK ADVERTISING —

(Continued from page 69)

the eye, but seems to the writer to be so prevalent as to lack originality. Dark greens and blacks are next in popularity, though many people would say these colors fall short in advertising punch. Orange and yellow are effective as eye catchers, and in combination with black or blue they sparkle and have originality.

Advertising approaches vary with the individual firm. There are many sound approaches, including the hard "wallop," the gentle touch, the suggestive lure, or just straight selling. Which one is used should depend on what the dealer feels are the characteristics of his potential customers.

Keeping the Truck Clean

It is extremely important that trucks be kept clean because people who see them and don't know the firm are going to form a quick opinion and judge the company's work by what they see. It is obvious that a clean truck with a well-lettered sign carries a far greater sales punch than a dirty truck with a poorly-designed sign.

Keeping roofing trucks clean is no easy matter. Mechanics who apply cements and coatings are likely to get some of this material on their hands and to transfer

Some filter users prefer to use their own personnel in removing and installing the filter. In cases such as this, the filter service operator will give a price based on picking the dirty filters up and delivering the clean filters to the filter users' dock. In some cases, where a user has a considerable number of filters to be serviced and where he is located at some distance from the shop, the filters are shipped prepaid to the filter service plant and the price is based on cleaning only.

it to many places on the truck. One man should be made responsible for the appearance of the truck or the driver himself should be trained to keep equipment in shape. In terms of sales results, the efforts pay off.

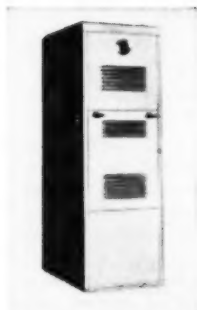
An attractive truck, moving through the streets, says to passers-by in convincing terms, "Here is a rolling concern. Someone is using its services." And if the signs are properly done, it will be clear just what these services are.

CLEANER AIR IS EVERYBODY'S PROBLEM

OCTOBER 18 to 24 was *Cleaner Air Week* in Chicago, held under the sponsorship of the Department of Air Pollution Control of Chicago in cooperation with various technical, industrial and civic organizations. In its promotion, the department pointed out that everybody is involved in air pollution. Among the sources of pollution listed were improper use of fuels and improper incineration of waste matter and garbage, as well as gases and fumes resulting from manufacturing activity and rubbish disposal. In its educational program directed to operators and owners of fuel burning equipment, the department urges citizens to 1) keep heating equipment clean and in proper condition; 2) use the correct grade of fuel for their equipment; and 3) operate this equipment with care and judgment.

TIPS ON SELLING FURNACES — REMEMBER . . .

NOTHING'S TOO GOOD FOR MOTHER



You can rely on



When it comes to her home, good's not good enough. It must be the best quality she can buy. Anyone can talk about quality to her. The trick is to prove it.

With Rheem Gas Furnaces, quality is easy to prove. First by explaining the exclusive Rheem Quality production methods. Second, by telling how every Rheem Gas Furnace is Fire-Tested at the factory to assure longer, more dependable service. And third, by showing how Rheem Quality is fully backed by the Rheem warranty—a warranty that says what it means and means what it says.

Tell the Rheem Quality story and find out what

it will do for you in building profits from larger sales, in savings from fewer costly service calls. You win twice when you sell the Rheem line. Write today for information about the complete line of Rheem gas furnaces.

RHEEM MANUFACTURING COMPANY AA-11
4361 Firestone Boulevard, South Gate, Calif.
Please send information on your complete line of furnaces.
Name _____
Address _____
City _____ State _____

RHEEM MANUFACTURING COMPANY

World's Fastest Growing Manufacturer of Warm-Air Heating Equipment



©1953. RHEEM MFG. CO.

STAINLESS STEEL CORROSION —

(Continued from page 65)

evaporation of entrapped solutions which have gotten in through seepage or other causes, particularly under humid or otherwise corrosive conditions.

By coating stainless steel surfaces, or allowing them to become covered or partially covered with coatings which are not homogeneous in their resistance to solution seepage, we can cause the setting up of corrosion cells. Recently a contractor desiring to protect a polished stainless steel canopy which he had erected on an office building facing the Atlantic Ocean, covered the surfaces with a certain type of glass wax, intending to remove this protective film by rubbing off when the office was opened for business some months later. However, when he came back to apply the final rubbing, the stainless surfaces were marred by an intermittent film of mostly iron chloride, as well as some corrosion pitting. The "protective" wax application had provided the necessary semi-permeable coating film to afford concentration cells, while the salty mist from the ocean condensing on the canopy provided the electrolyte, this condensate forming sodium chloride solution.

If the victim of this mal-practice had cleaned off the rusted surfaces with ordinary steel wool, before long the surfaces would again have been marred from galvanic action between the iron particles residual on the stainless steel surfaces due to the rubbing action involved.

Similar harmful effects have been noted in stainless steel store front installations and other installations partially sheltered from the weather, on which coatings of local atmospheric deposits (dirt and dust) have been allowed to accumulate. Since such coatings are not uniform in texture they provide adequate media for the start of pit-type corrosion. Such stainless surfaces should be cleaned occasionally to maintain them free from corrosive attack. At the same time, stainless steel surfaces which are freely exposed to the washing action of rain water are not vulnerable to such corrosive influences. Stainless steel roof drainage equipment is usually in this category as well as exposed stainless steel roof and tower surfaces.

Overall Chemical Attack Infrequent

Stainless steel is resistant to most of the oxidizing acids, most organic acids, fruit juices, etc., while offering rather poor resistance to the reducing acids such as sulfuric, hydrochloric, etc. Before deciding to use stainless steel which is to be in contact with various corrosive influences it is best to apply to the steel manufacturer for advice. Since most fabricators have been following this procedure, failure from this source is unusual.

A prolific source of overall chemical attack can be soldering acid. After soldering, the flux should be neutralized with a solution of baking soda or some other convenient alkali and then a water rinse should be given.

Seepage from adjacent walls, and drainage from adjoining gutters, canopies, etc., can be rich enough in corrosive salts to cause overall chemical attack on stainless steel surfaces, or at least in some cases the start of pit-corrosion.

Surface Corrosion Can Be Prevented

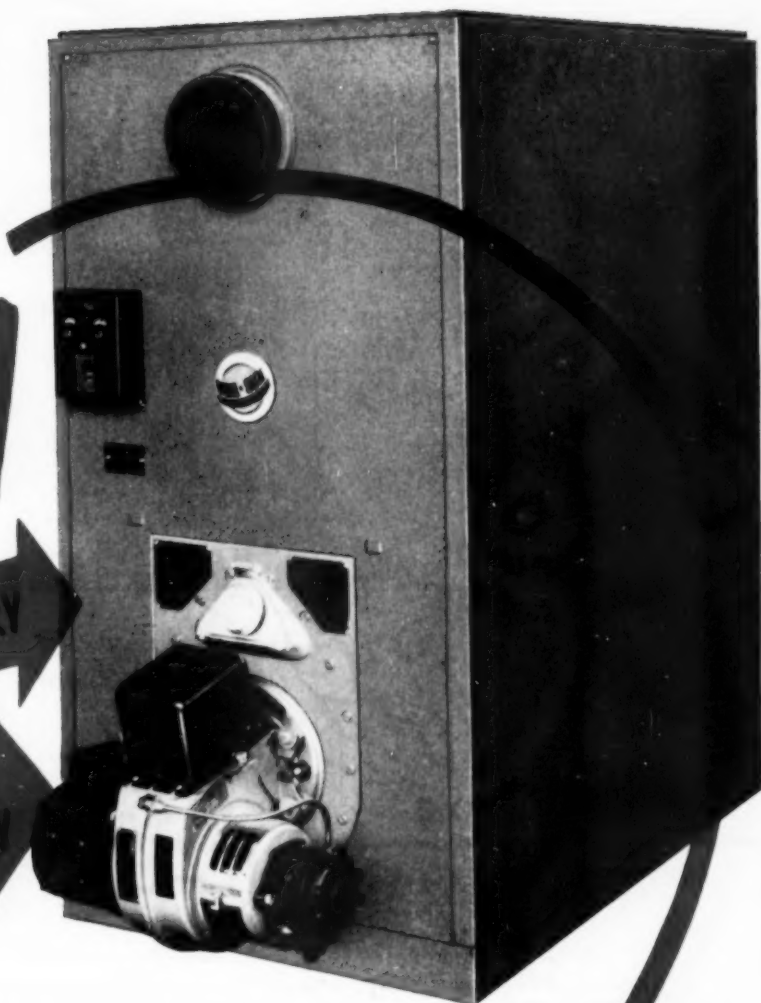
A number of general rules can be followed for preventing corrosion of stainless steel surfaces:

- 1 Avoid permanent contact of stainless with baser metals, particularly iron or steel screws, nails, or any other supporting hardware. Under these conditions, dissimilar metals will have an electrical battery effect known as galvanic action.
- 2 If it is necessary to contact dissimilar metals, insulate both metals with a good paint or plastic coating and thus avoid the possibility of corrosion from galvanic action.
- 3 Avoid joining stainless with other metals by threaded connections, as the threads of the less noble metal will deteriorate excessively.
- 4 Avoid lap-joints if possible, or thoroughly seal them with metal solder or caulking — especially under humid or otherwise corrosive conditions.
- 5 Avoid coating exposed stainless surfaces with protective films. In practically all cases of atmospheric exposure, the stainless steel surface can take care of itself.
- 6 Avoid coatings of dirt and dust, particularly where outdoor stainless steel surfaces are not fully exposed to the washing action of the elements. Clean such surfaces at reasonably frequent intervals.
- 7 Avoid prolonged exposure of stainless steel surfaces to the corrosive action of soldering flux. After soldering, neutralize with a convenient alkali solution, followed by a final water rinse.
- 8 Avoid seepage or dripping on stainless steel surfaces from adjacent walls, roof surfaces, etc.
- 9 For cleaning stainless steel utensils, sinks, table tops, etc., observe the following rules:
 - a) Never use ordinary steel wool. If abrasive action is required, use stainless steel wool.
 - b) Water solutions of plain soap, soda ash, tri-sodium phosphate, sodium pyrophosphate, etc., are satisfactory for stainless steel surfaces. If adherent particles or films must be removed, any good grade of fine scouring powder may be applied, and if further abrasion is needed, it may be used in conjunction with stainless steel wool.
 - c) If discoloring is encountered due to exposure to high heat or to the oxidizing effect of food stuffs dried in stainless steel vessels at high heat, usually vinegar, or a dilute (2 to 5 per cent) solution of oxalic acid will remove the coloring film. Always neutralize with a solution of baking soda or its equivalent followed by water rinse.
 - d) Avoid if possible the use of chlorine-bearing compounds for cleaning or sterilizing stainless steel equipment. If used they should be allowed in contact with the stainless surfaces for a short time only and then followed by water rinsing.

IT'S NEW

READY FOR DELIVERY

LOW IN COST...
HIGH IN EFFICIENCY



Sell more warm air installations... get a bigger share of available heating business with the new Mor-Sun series of MIGHTY LOW BOY Forced Warm Air Furnaces. Priced right for quick, profitable turnover, these new Low Boys have all the quality features of the Mor-Sun DeLuxe line... check these sales-builders:

- **LOW COST**... Forced Warm Air Furnace with outputs from 68,000 to 95,200 BTU's.
- **10-YEAR GUARANTEED HEAT EXCHANGER**... Engineered for Maximum Heating Efficiency.
- **LABOR SAVING INSTALLATION**—Quick—Simple.
- **COMPACT**... Only 46" high, 24" wide, 35" deep.
- **GAS or OIL**... Burners Interchangeable with No Loss in Efficiency.

The building trades asked Morrison for a low cost, quality forced warm air furnace... here it is... Cash-in on the ready-made demand for this fast-moving Mor-Sun line of new MIGHTY LOW BOY Forced Warm Air Furnaces as a Mor-Sun Dealer. Fill in the coupon and get the whole story NOW!

MOR-SUN FURNACE DIVISION
MORRISON STEEL PRODUCTS, INC.
609 Amherst Street • Buffalo 7, N. Y.

Also manufacturers of Roly-Door Steel Sectional Garage Doors and Carry-All Truck Bodies

MOR-SUN MIGHTY LOW BOY FORCED WARM AIR FURNACE

For More
Profits with
MOR-SUN...
MAIL THIS
COUPON!

Morrison Steel Products, Inc.
609 Amherst Street
Buffalo 7, New York

Gentlemen:

Please send me complete details on Mor-Sun's new MIGHTY LOW BOYS and the Mor-Sun Plan for Bigger Dealer Profits.

Firm Name _____

Address _____

City _____

Zone _____

State _____

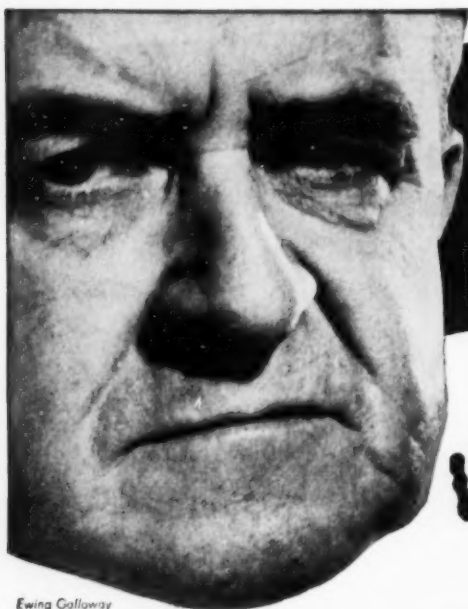
☐ Distributor

☐ Dealer

☐ Installer

(PLEASE CHECK)





Ewing Galloway

STOP

NOISE VIBRATIONS

install

Flexi-Duct

**ASBESTOS
WOVEN**

TAPE

Eliminate noise and vibrations in duct systems once and for all! Simply install *Grant Wilson* asbestos woven FLEXI-DUCT Tape between the blower and furnace casing—plenum and furnace casing—or on take-offs and main or branches.

Mechanical rattles, starting, "on and off" cycle noises, screeching and other annoying sounds must be stopped, and they *can* be stopped with asbestos FLEXI-DUCT Tape. This approved all-asbestos, fireproof band protects you against costly "Call-Backs"—and gives silent, quiet operation on all your jobs.

See how you can insure all your Forced Air Heating, Air Conditioning, Ventilating and Conversion jobs against noise traveling to occupied areas.

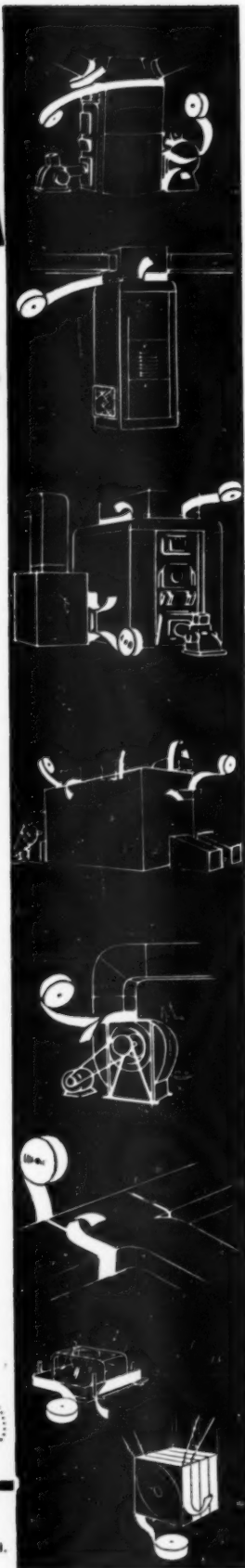
WRITE TODAY for FREE Samples and data on *Grant Wilson* asbestos woven FLEXI-DUCT Tape.



Grant Wilson inc.
ASBESTOS and INSULATING MATERIALS

Blue Striped, interwoven edges—6" wide—50 lineal feet. Ind. packed.

BULLETIN 7511-A
Board of Trade Bldg., Chicago 4, Ill.

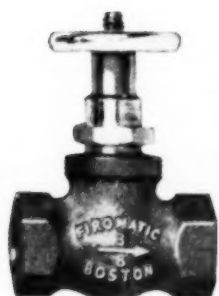


Firomatic

PRODUCTS

VALVES • FUEL OIL FILTERS • SAFETY DEVICES

Firomatic Fusible and Non-Fusible Valves



Illustrated are Globe and Angle Valves — two of more than 80 different types available in a line that includes Globe, Check, Lever, Anti-hum, Tank and Range Burner Valves. All Firomatic Fusible and Non-Fusible Valves can be operated manually and are provided with self-adjusting stuffing box and back seat feature which prevent leaks at the valve stem.



FIROMATIC TANK VALVE

The newest addition to the Firomatic line, the offset angle tank valve is designed for use on any oil tank or drum. Available in fusible and non-fusible types, they give a straight-thru connection from the tank to the valve to the filter, eliminating the use of fittings which increase the danger of joint leaks.



YOU CAN PAY MORE, BUT YOU CAN'T BUY BETTER

Send For New Catalog "F"

THE MORSE-SMITH-MORSE CO.

165 Dexter Avenue
Watertown, Mass.

**SOLD NATIONALLY
BY JOBBERS ONLY**

WHAT THE ASSOCIATIONS ARE DOING



THE GAME never ends for Len Miller, Charlie Bennett and Ray Hubbs

Golf Association Holds Season's Third Meet

MEMBERS OF the Chicago Warm Air Golf Association, representing the contracting, wholesaling and manufacturing fields, meet three times each summer — each with the hope of winning the annual silver loving cup awarded to the golfer who has the two lowest net scores. This year the winner was Gunnar G. Olsenius with a score of 71-72. Runner-up was Mel Jackson, who received honorary mention for his 72-72 scores.

The tournament was held at the Ruth Lake Country Club, Hinsdale, Ill., and was attended by 59 members and their guests. Prizes were awarded to 39 of the players. Prize winners, in order of scores (computed by the adjusted scoring system), were announced by W. J. Pennington, chairman of the awards committee, as follows:

Low Net

A. Schultz — Briggs & Turivas
 Mel Jackson — Grant Wilson, Inc.
 Gunnar Olsenius — U. S. Steel Co.
 G. Brodt — Aire-Flow Heating Co.
 K. Jensen — Guest
 J. Pruneau — Chicago Furnace Supply Co.
 H. Venzke — Chicago Furnace Supply Co.
 R. Lorenz — Chicago Furnace Supply Co.
 Jim Pennington — American Blower Co.
 W. Hulbert — Condensation Engineering Corp.
 T. Jones — Condensation Engineering Corp.
 R. Olson — Barney Olson Co.
 C. Price — American Artisan
 Charlie Bennett — Armstrong Heating Supply Co.
 Len Miller — Crosstown Heating Co., Inc.
 R. Hubbs — Hubbs Sheet Metal Co.
 F. Boone — Guest
 B. Cherullo — Sheldon Heating Co.
 W. Pennington — Dole Valve Co.
 Lars Schulein — L. E. Schulein Co.
 D. Hoover — Guest
 George Anderson — Condensation Engineering Corp.
 H. McCubbin — Central Plumbing Supply Co.
 M. Wallin — Byfield Co.
 R. Johnson — Atkomatic Valve Co.
 L. Lundquist — Atkomatic Valve Co.
 J. Butler — Air Products Equipment Co.



MEL JACKSON presents the annual golf trophy to the 1953 winner, Gunnar G. Olsenius

George Bunt — Jones Sheet Metal Co.
 F. Meunier — Jones Sheet Metal Co.
 M. Primich — Gary Steel Products Co.
 R. Martin — Peoples Gas, Light & Coke Co.
 B. A. Johnson — Barney Olson Co.
 F. Schroeder — Aire-Flow Heating Co.
 Larry Ingham — Aire-Flow Heating Co.
 Clyde Barnes — American Artisan

Blind Bogey

J. Garrett — Briggs & Turivas
 T. Johansen — Central West Machinery Co.
 C. Marquist — Alladen Engineering Co.
 L. Walquist — Chicago Furnace Supply Co.
 R. Vlk — Mechanical Home Systems, Inc.

Non-Golfer

Charles Atkinson — L. E. Schulein Co.

Kalamazoo Contractors Hear Talk on Overhead

THE PROBLEMS of overhead were discussed by N. J. Biddle, secretary, Michigan Heating and Sheet Metal Association, at the September meeting of the Kalamazoo Sheet Metal, Roofing, Heating and Air Conditioning Contractors Association. Mr. Biddle covered a number of aspects of the subject, including finding overhead, relating it to the individual job, getting all of the items of overhead included as such, and using the rolling method of computation. He pointed out that overhead is not static but continually varies and that certain controversial items should rightfully be classified as overhead.

Series on Business Insurance

THE MONTHLY newspaper of the Roofing and Sheet Metal Crafts Institute, New York City, is publishing a series of management aids covering business insurance. The articles, designed to tell the small businessman in brief, non-technical language about the various types of insurance policies available to fill the specific needs of his business, were prepared by the Association of Casualty and Surety Companies in cooperation with the Management Service Div., Small Defense Plants Administration.

Coming Events

Dec. 2-3 — National Warm Air Heating and Air Conditioning Association, Annual Convention. Hotel Cleveland, Cleveland. George Boeddener, Managing Director, 145 Public Sq., Cleveland 14.

Dec. 7-9 — National Heating Wholesalers Association, Inc., Annual Convention. Conrad Hilton Hotel, Chicago. C. Stuart Rambo, Executive Secretary, 27 E. Monroe St., Chicago 3.

Jan. 17-20 — New York State Sheet Metal, Roofing & Air Conditioning Contractors Association, Annual Convention. Seneca Hotel, Rochester. Clarence J. Meyer, Secretary, 567-69 Genesee St., Buffalo.

Jan. 18-19 — Chicago Indoor Comfort Conference, Graemere Hotel, Chicago. George Kalvog, Chairman, 855 N. Cicero Ave., Chicago.

Jan. 25-27 — American Society of Heating and Ventilating Engineers, 60th Annual Meeting. Rice Hotel, Houston. A. V. Hutchinson, Secretary, 62 Worth St., New York 13.

Feb. 4-5 — Sheet Metal and Warm Air Heating Contractors' Association of Indiana, Annual Convention. Hotel Severin, Indianapolis. Frank E. Anderson, Executive Secretary, 439 S. 17th St., Terre Haute, Ind.

Feb. 11-13 — Sheet Metal and Roofing Contractors Association of Minnesota, Annual

Convention. Radisson Hotel, Minneapolis. Arlowe W. Esau, Secretary, Mapleton, Minn. Feb. 22-24 — Ohio Sheet Metal Contractors Association, Annual Convention. Deshler-Wallick Hotel, Columbus. William C. Lumm, Secretary, 2512 Albion St., Toledo 6.

Feb. 24-25 — Michigan Heating and Sheet Metal Association, Annual Convention. Pantlind Hotel, Grand Rapids. N. J. Biddle, Secretary, 3035 E. Grand Blvd., Detroit 2.

March 8-10 — Sheet Metal Contractors Assn. of Wisconsin, Inc., Annual Convention. Schroeder Hotel, Milwaukee. Irv. Kanitz, Secy., 225 E. Michigan St., Milwaukee.

April 20-22 — Sheet Metal Contractors Association of Illinois, Inc., Annual Convention. Abraham Lincoln Hotel, Springfield. E. A. Schmidt, Secretary, 1210 E. Laurel St., Springfield.

May 16-20 — Oil Heat Exposition sponsored by Oil-Heat Institute, Commercial Museum, Philadelphia. R. H. L. Becker, Managing Director, 500 5th Ave., New York 36.

June 10-12 — Roofing and Sheet Metal Contractors Association of Georgia, Annual Convention. General Oglethorpe Hotel, Savannah, Ga. B. L. Noblitt, Secretary, P. O. Box 1196, Augusta.

Air Conditioning Contractors Hold Golf Meet

EACH YEAR the Air Conditioning Contractors Alliance holds its annual golf tournament and social outing at one of Chicago's country clubs. This year the event was held at the River Forest Country Club, Elmhurst. Forty-six members and guests attended and taxed their golfing skill for a chance at winning one of the two annual trophies awarded at this event.

The winner of the low gross trophy was Frank Schroeder of Aire-Flow Heating Co. and the low net

trophy was won by Les Solstad of the Austin Sheet Metal Works. The blind bogey prize went to Jay Boslough, Boslough Heating Corp., and Frank Schroeder also won the prize for the fewest putts.

Runners-up for the prizes were:

Low Gross: Bob Lorenze — Chicago Furnace Supply Co.

Low Net: P. Brodt — Guest

Blind Bogey: Joseph J. Kaberlein — Sheet Metal Apprentice Training Committee

Putting: Herbert Venzke, Jr. — Chicago Furnace Supply Co.

(More association news on page 142)



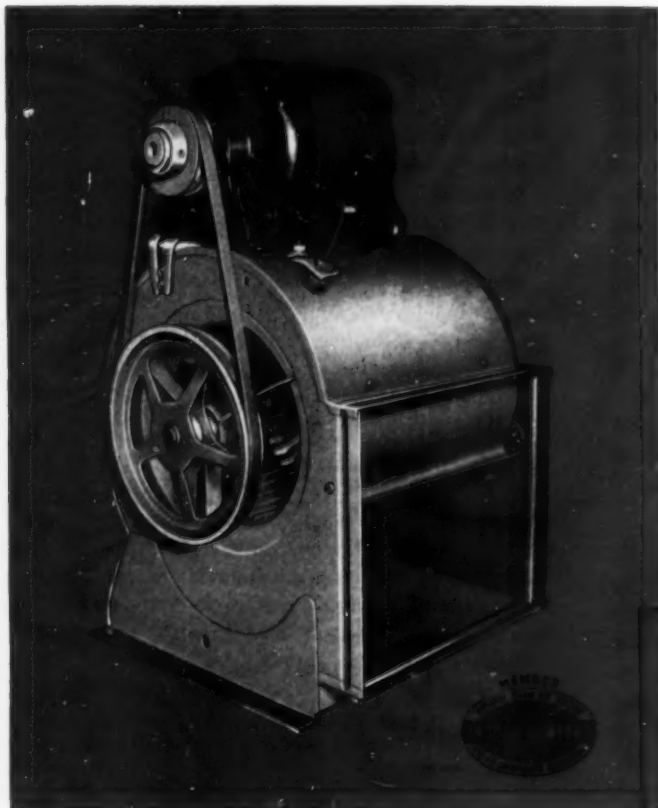
LESTER SOLSTAD receives the trophy for low net golf score from Jack Demling



FRANK SCHROEDER is congratulated by association secretary Jack Demling on winning the trophy for low gross golf score

LAU**offers You America's Most Outstanding****Blower Assembly Unit**

the new, improved series "A" unit



The ALL NEW ... A7DD Direct-Drive DOUBLE INLET BLOWER

Perfect unit for in-a-wall gas and oil furnaces ... has fingertip adjustment for wide range 7-speed control. For furnaces to be rated at capacities from 44,000 to 76,000 b.t.u. per hour (bonnet) at 100° temperature rise—or capacities from 31,000 to 54,000 b.t.u. per hour (bonnet) at 70° temperature rise.

Now further improved ... the last word in product development ... LAU Series "A" Blower Assembly. It is an outstanding achievement in the blower field. Over-all size is smaller, more compact. Many features are revolutionary ... exclusive with LAU ... and fully protected. The entire unit is die formed to lend itself to mass production on precision-built equipment, with reflected low costs.

These Outstanding Features:

- Newly developed 1-pc. Motor Mounting
- 3-point Suspension Bearing Bracket
- Bearing Assembly with long-life lubrication
- Positive Alignment Wheel to Venturi
- Newly Improved LAU steel Pulley Wheel
- Strong, Compact, Versatile Housing Base
- Unit has efficient Center Suspension Wheel
- Improved Discharged Outlet Design
- Sturdy, Efficient Scroll Design
- Off-set in Scroll sides. Many other features



The A7DD is completely UL approved, covering the ENTIRE unit (also approvable in combination with furnace).

THE**BLOWER COMPANY • DAYTON 7, OHIO**

2011 Home Avenue • Write for Full Information

World's Largest Manufacturers of Warm Air Furnace Blowers

.... the **BEST BUY** for—
INCREASED ATTENTION
and
LASTING SALES POWER

THE JANUARY 1954 ISSUE
and 20th Annual Directory Number of
AMERICAN ARTISAN

DIRECTORY SECTION

We'll tell who makes the products used in this field and their trade names. All advertisers as they appear in this Directory Section will be prominently identified indicating that more detailed information is elsewhere in the issue. It's the industry's best and most complete **BUYING GUIDE**—printed on colored stock in a special section.

**STANDARD EDITORIAL
CONTENT**

January AA will be a "regular issue" in every respect. It will carry a full quota of timely articles—the same as in every issue of this field-leading book. For extra attention value, it will have heavy covers, and be specially mailed.

Here's a regular issue, and a directory issue, combined in one great January number . . . and *no advance* over regular issue rates!

Here your advertising will get *increased attention*, and have *lasting sales power* (as product reference copy) throughout all of 1954.

Here is the "best buy" of the year in our field . . . the place where a convincing sales story of your complete facilities will do you untold good.

Here is where *extra* space for *extra* emphasis belongs!

Most advertisers use increased space with us in January—spreads, inserts, color. They catalog their entire lines. You, too, can profit most by doing a complete job. Make space reservation now . . . we'll be glad to help with copy preparation if needed.

AMERICAN ARTISAN

6 North Michigan Avenue

Chicago 2,

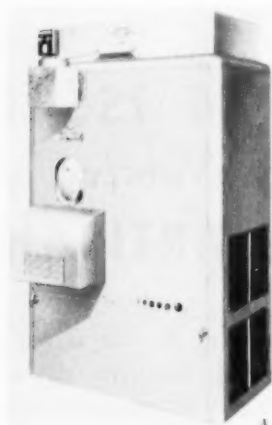
Illinois

EQUIPMENT DEVELOPMENTS

The latest information on manufacturers' developments is presented here with brief summaries of the applications of these products. For new literature giving product information which is available see page 152.

Year 'Round Air Conditioner

PACKAGED, YEAR 'ROUND gas or oil fired air conditioner — Frigidaire Div., General Motors Corp., Dayton 1. It utilizes a new forced air furnace for which the heating fuel can be oil, or natural, manufactured or artificial gas. Burner mechanisms are all non-clogging, the company states. Heating capacity is 75,000 Btu per hr output with oil, 72,000 Btu per hr output with gas. The summer cooling system has a 3 ton capacity.



Above: Combustion Chamber

Left: Conditioner

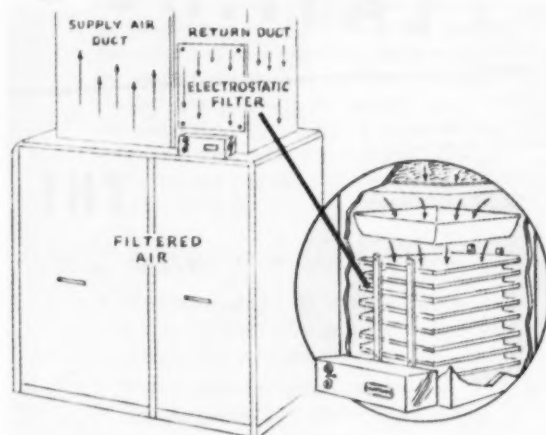
Vertical Oil Burner Combustion Chambers

"INSUL-LYTE" PRE-CAST oil burner combustion chambers in four new round vertical type models — Insulating Castable Corp., 130 W. Pleasant Ave., River Rouge 18, Mich. Two models (one with 0.65 to 0.90 gph capacity, the other, 1.00 to 1.35 gph) are made in two and four piece units. The larger models (with capacities of 1.50 to 1.85, and 2.00 to 2.50 gph) are made in six piece assemblies to facilitate installation in limited working areas. The two smaller models are cast with a base and sidewall fillet designed to eliminate restriction and pulsation and to allow smooth flame travel. The larger models feature vertical tongue-and-groove joints and an insulated base. There is a built-in corbel on all models. Dimensions range from 11½ in. outside diameter and 14 in. overall height on the smallest model to 17 in. outside diameter and 14½ in. overall height on the largest.

Electrostatic Air Cleaner for Homes

ELECTROSTATIC AIR CLEANER designed to keep homes dust free, for installation into the cold air return duct of the warm air furnace — Radex Corp., 2076 Elston Ave., Chicago. The cleaner can be installed in new or reconditioned furnaces which are coal, gas or

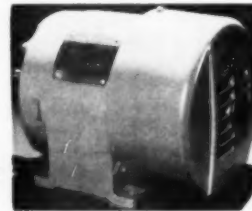
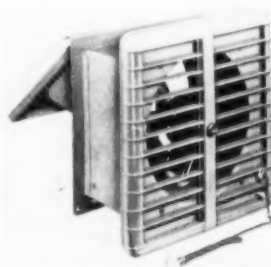
oil fired. It is composed of a mechanical filter, a series of electrostatic filter plates and a power pack. Cold air is drawn from the floor through the cold air duct, and passes through a mechanical filter where much of the dust and pollen is caught. The air then flows through multiple electrostatic filter plates where each dust or



pollen particle receives a negative electrical charge. The particles are attracted to the electrostatic collector plates where they are caught and held. A fungicidal and germicidal solution on these plates is intended to destroy any germs or bacteria. Dust collecting capacity depends on the number and size of the filter plates, eight plates being required for a seven room home.

Kitchen Ventilator Unit

MODEL LC-8 kitchen ventilating unit designed for wall installation — The Ilg Electric Ventilating Co., 2850 N. Crawford Ave., Chicago 41. The units, designed for the low cost market, feature an air exhaust capacity of 425 cfm, a totally enclosed 1550 rpm motor and "Neoprene" covered, greaseproof connections.



Above: Motor

Left: Kitchen Ventilator

Motors with New Insulation

"TRI-CLAD 55" POLYPHASE a-c motors featuring size and weight reductions, new insulation, new bearing assem-

bly and ventilation plan, and built in the latest standard NEMA frame dimensions — Small Integral and Medium Induction Motor Depts., General Electric Co., Schenectady 5. A new polyester film is used for insulation. This film is eight times as strong as previously used materials, the company states. It insulates the phases and slot tubes in the stator. The bearing assembly is more tightly sealed and is lubricated by a grease designed to last an unusually long time. A double end ventilation system cools the motor by drawing air in from beneath both endshields through baffled air passages and out louvers on the sides of the frame. The noise level on the new 10 hp motor tests as low as the company's former 2 hp model, it is reported. The new motors have an average size reduction of 50 per cent by volume and 22 per cent less weight per horsepower than the previous models.

Highboy Furnaces

THREE NEW highboy furnaces with gun type, flanged oil burners — Certified Furnace Corp., Trenton 3. With rated bonnet outputs of 73,000, 90,000 and 110,000 Btu per hr. all three models are 62 in. in overall height and 20 in. wide. They feature a ceramic combustion chamber, full size blower and a large inspection door of the self-closing type. Return air can be brought into the bottom of the furnace on either side. Side filter brackets are furnished as standard equipment. Heat exchangers are constructed of 14 gage steel.



Above: Blower Ventilator

Left: Furnace

Spun Aluminum Blower Ventilators

THREE NEW spun aluminum blower ventilators for residential or commercial use — Loren Cook Co., 664 Front St., Berea, Ohio. The Model W wall exhaust ventilator is adjustable to any wall thickness from $5\frac{1}{8}$ to 3 in., or can be fitted to a short 6 or 8 in. duct. It is available in 7, 9 and 10 in. sizes, and is furnished for 110 volt operation. The Model R roof ventilator, for bathroom and shower room ventilation, is offered in 7, 9, and 10 in. sizes, with a collar to fit over a standard 6 or 8 in. duct leading to the roof. On both models,

the motor is mounted out of the air stream. The largest ventilator, the Model BV, is available with a 9, 10, 12, or 14 in. impeller, in single phase, 110 volt, two speed; 220 volt, single speed; or 3 phase, single speed. It can be furnished with or without automatic back draft dampers. The impeller on all models is backwardly inclined and non-overloading. All models are direct drive.

Baseboard Perimeter Diffuser

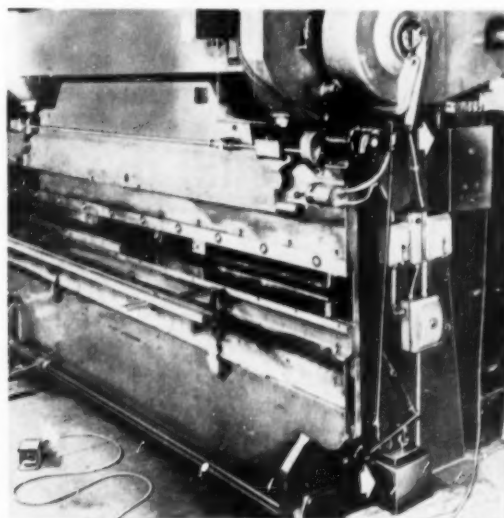
SERIES 130 DIFFUSERS for installation along the baseboard in perimeter heating systems — Air Control Products, Inc., Coopersville, Mich. The units are designed to give uniform air distribution without use of turning



vanes. They are available as single units or in multiples to form a continuous baseboard along one or more walls. The diffusers consist of two pieces and are installed with a tin snips and screwdriver.

Automatic Press Brake Control

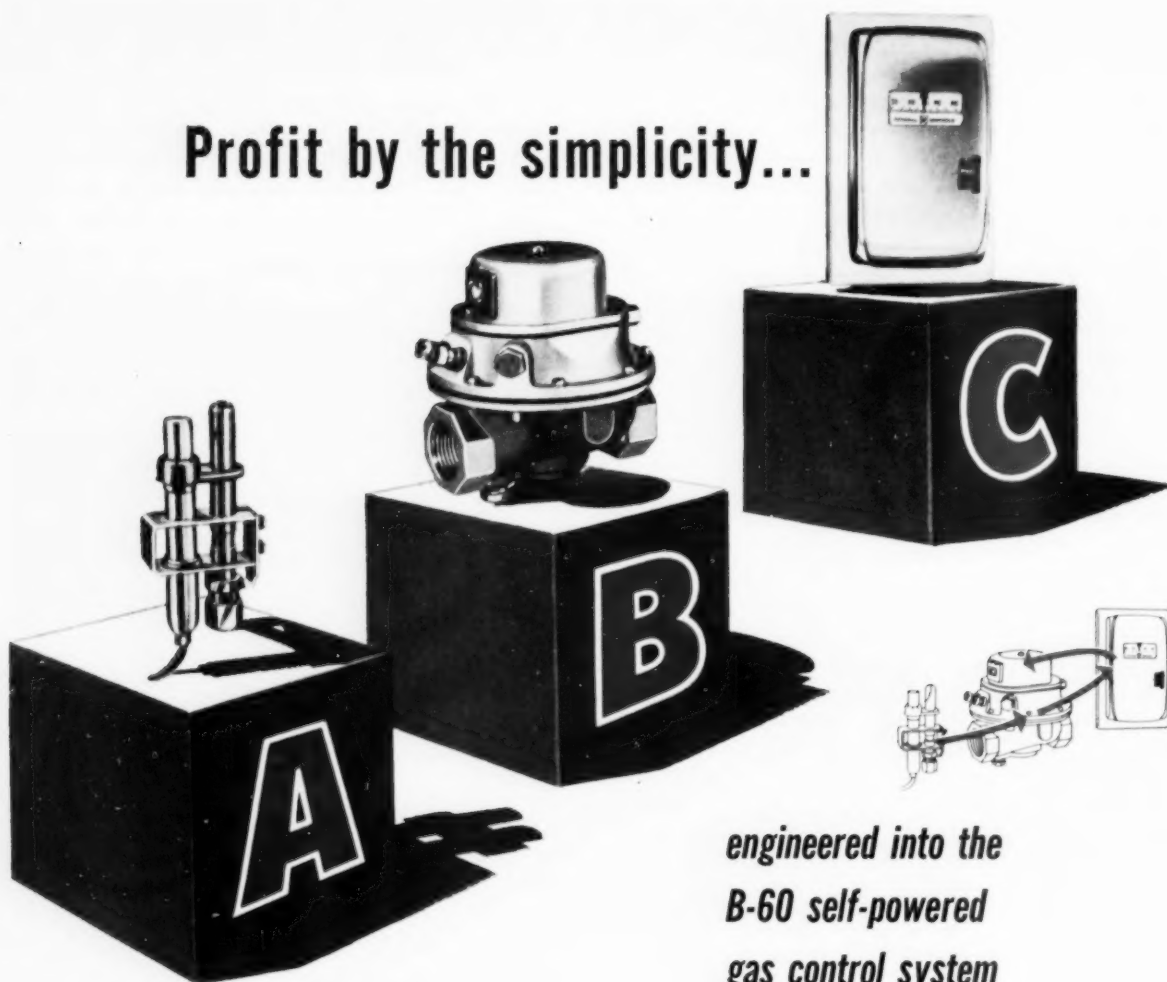
AUTOMATIC PRESS brake control (arrows) to prevent press brake accidents and to increase production — American Actuator Corp., 40 Hudson St., New York 13. With the control, the ram of the press brake can be set



to stop automatically at any point in the downstroke by knob adjustment of the pre-determined stop. The complete operation is controlled by a master control panel. The control consists of the panel, a solenoid, a foot switch, and an automatic switch box tied in with the

(Please turn to page 143)

Profit by the simplicity...



*engineered into the
B-60 self-powered
gas control system*



Economy . . . safety . . . long life . . . trouble-free service . . . these are some of the values engineered into General Controls' simplified B-60 all-gas control system. The pilot generator produces electric current and provides safety shutoff in case of pilot flame outage. The diaphragm gas valve opens and closes the fuel line, operating entirely on current supplied by the pilot generator. The room thermostat activates the gas valve, maintaining selected room temperatures. Simple to install, the B-60 system was the *original* self-powered all-gas control system. It is still first in the field today!

GENERAL CONTROLS

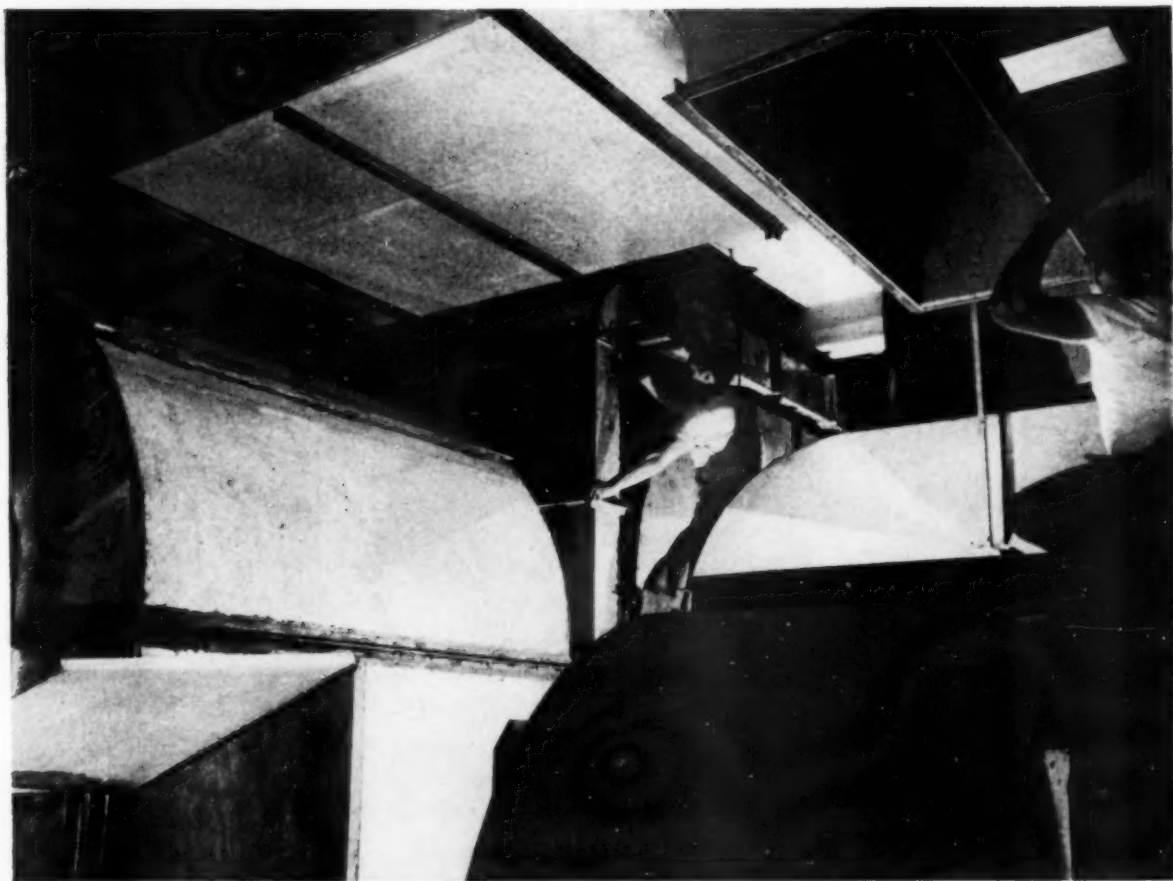
Glendale, California • Skokie, Illinois

Manufacturers of Automatic Pressure, Temperature, Level and Flow Controls for Heating, Home Appliances, Refrigeration, Industrial and Aircraft Applications.

FACTORY BRANCHES IN 36 PRINCIPAL CITIES

See your classified telephone directory.





Galvanized Steel Costs Less than Sheets of Other Metals

Compare steel with any other sheet metal on the basis of equal strength and you will find that it costs substantially less. To equal the strength or stiffness of light-gage steel, other metals must be used in relatively thick and expensive gages.

If you compare steel with other metals on the basis of equal weight, again you will see that steel is less expensive. Pound for pound, no other commonly used sheet metal can match the low cost of steel.

Bethlehem galvanized sheets are made from strong, durable steel, either plain or copper-bearing. They carry a tight, uniform coating of zinc to provide superior corrosion-resistance. They look good. They have excellent workability, and they give a professional finish to any sheet-metal job.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

Bethlehem
GALVANIZED
Steel Sheets



*Products
of
Character*

YOU CAN SPECIFY
WITH CONFIDENCE



Brundage

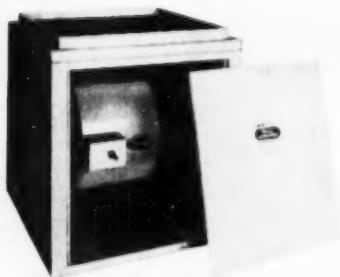
DIRECT DRIVE BLOWER

... the solution to your furnace design problems

Designed into your furnace in any position you desire, the Brundage Direct Drive Blower assembly will operate with unparalleled efficiency. There are no space-consuming belts or pulleys. Its compact size... $10\frac{1}{2}'' \times 15\frac{1}{2}'' \times 14\frac{1}{4}''$... gives you an opportunity to decrease the over-all size of your furnace without impairing air circulating and heating performance.

The Brundage Direct Drive Blower has a handy five speed switch that permits quick selection of just the right blower speed for any particular air circulating condition. The blower wheel is mounted on the motor shaft and cannot get out of alignment. The motor is life-time lubricated.

These are but a few of the reasons why it will pay you to investigate the Brundage Direct Drive Blower assembly ... a Product of Character you can specify with confidence. Write for details today.



Brundage Direct Drive Blower Filter
Package Unit

THE *Brundage* COMPANY

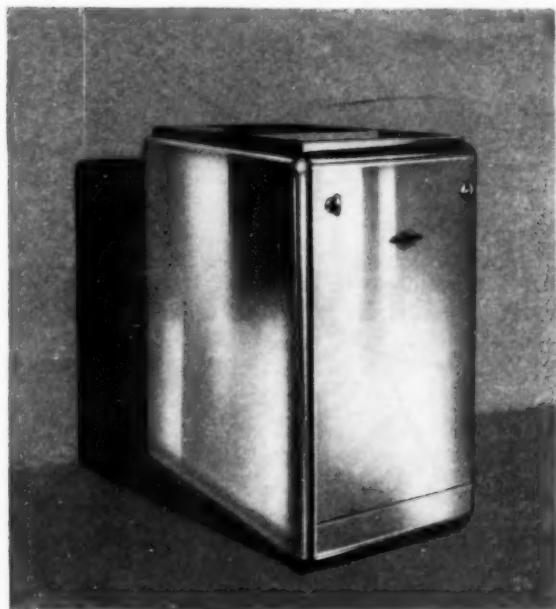
Blower Specialists Since 1919

516 NORTH PARK STREET • KALAMAZOO 11, MICHIGAN

Northwest Representative: Harold Winningham & Co., 1117 Second Ave., Seattle 1, Washington



There's a treasure chest of profits in the heating line that's geared to today's special building problems!



Compact new DELCO-HEAT Conditionairs sales engineered for today's warm air needs

Again Delco-Heat sets the pace for sales with a complete new line of oil-fired Conditionairs tailored to modern home heating problems. Two new high units, 80,000 and 100,000 Btu output are Underwriters' approved for close-clearance installation. Ideal for closet or utility room application . . . cold air return can be installed at either side or bottom of unit to meet various types of home construction.

Plus four new basement models at 80,000, 100,000, 125,000 and 150,000 Btu output. Smartly styled for deluxe installation and economy-priced for sales appeal.

All models insulated with aluminum foil-backed fiber

glass and factory assembled* for easy installation. Here is further proof of why General Motors Delco-Heat is the real shortcut to profits. Advanced engineering, full-scale advertising, and competitive pricing mean more sales—help to make this the most valuable franchise in the entire industry.

**The 150,000 BTU model is shipped knocked down for easier handling.*

For more information write or wire: Delco Appliance Division, Dept. AA, General Motors Corp., Rochester 1, N. Y. In Canada: Delco-Heat, Toronto 13, Ontario.

For a good deal—
DEAL WITH DELCO

**GENERAL MOTORS
DELCO-HEAT**

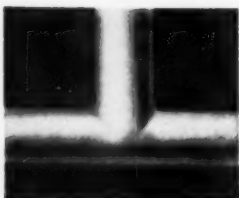
General Motors Engineering

Delco Production Skill



...your keys to Sales Success

... a complete line of automatic oil- and gas-fired conversion burners, Conditionair forced warm air furnaces, boilers, and electric water systems.



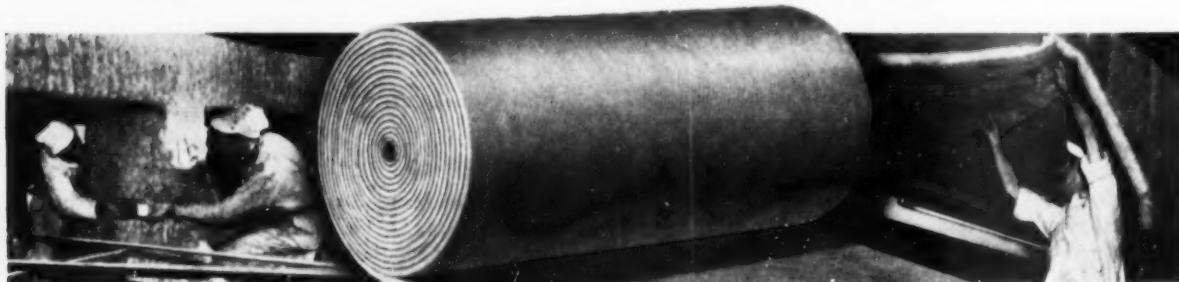
MICROLITE fits any shape



The fact that ducts come in assorted shapes and sizes is what endears Microlite glass fiber insulating wool to the guys on the job. Microlite is so soft and compressible and lightweight it can be wrapped easily around any shape or system—in the hardest-to-get-to locations. Clings like the proverbial vine. Is so tough it doesn't

have to be babied. Doesn't itch. Cuts easily with knife or scissors. Can be quickly fastened by adhesion or stapling. And on top of all that, inch for inch Microlite is one of the most effective of all insulating materials from sub-zero to 400° F. For folder and samples write to Glass Fibers Inc., 1810 Madison Avenue, Toledo 2, Ohio.

MICROLITE is an excellent absorber of sound • **MICROLITE** is inorganic, resists fire and moisture
MICROLITE is fungus-and-bacteria proof • **MICROLITE** is shipped in space-saving rolls compressed 4-to-1



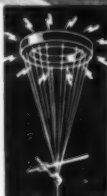
VITRON Glass Textile Yarns • Rovings • Micro-Fibers

DURAMAT Vapor Barriers • **BLUE FLAG** Pipe Wrap

MICROLITE Thermal and Acoustical Insulation

VIBRAGLASS Mounting and Packaging-Materials

COUSTIC-AIRE and **THERMO-JET** Aircraft Insulations



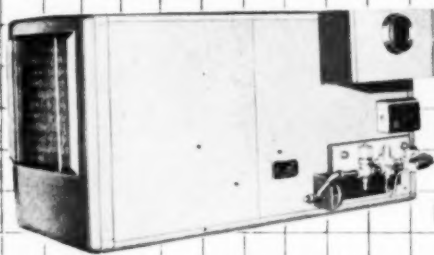
GLASS FIBERS INC.

Makers of glass fibers by the ELECTRONIC-EXTRUSION process
 ... developed, patented and used exclusively by Glass Fibers Inc.

*Fit them into almost
Any Space!*

MONCRIEF

*Horizontal Furnaces
Gas fired Oil fired*



The GAS FIRED FURNACE

2 SIZES

65,000 B. T. U. Input

85,000 B. T. U. Input

**MONCRIEF HORIZONTAL
FURNACES EASY TO INSTALL**

Deliver heat from any location. Install in
attic . . . crawl space . . . Utility room. For
residential and commercial installations.

The OIL FIRED FURNACE

2 SIZES

84,000 B. T. U. at Bonnet

123,000 B. T. U. at Bonnet

Quality Products Attractively Priced!

See your Moncrief jobber. Get the story on the complete line of Moncrief heating and air conditioning equipment, Unit Heaters, Incinerators and carton packed Snap Lock Pipe, Perimeter and Extended Plenum Fittings.

THE HENRY FURNACE COMPANY

Medina, Ohio

HEATING AND AIR CONDITIONING UNITS

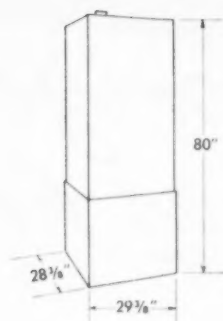
MONCRIEF
SINCE 1895

FURNACE PIPE AND FITTINGS

■ SAVE SPACE with the TYPHOON

Residential Year-Round Model S-W Air Conditioner

2 and
3 ton
Upright Unit



A FULL Line of Residential Models

There's a Typhoon residential year-round unit to fit ANY specification. Oil or gas-fired, water or air-cooled, up-right or counterflow — you'll always have the answer with Typhoon S W Units!

**Typhoon ONE-BUTTON Control is a
sure-fire sales point!**

TYPHOON
AIR CONDITIONING

TYPHOON AIR CONDITIONING CO., INC.

794 Union Street

Brooklyn 15, N. Y.

Specialists in Air Conditioning Since 1909

You get ALL these Features when you buy PET Drills!

Reserve Power—for the extra-tough job.
Powerful, Continuous-Duty Motors—built in PET's own factory. Dynamic-ally Balanced Arm-atures—for freedom from vibration.

Six Heavy-Duty Ball and Needle Bearings.

Compact Design—makes hard-to-reach drilling jobs easier and faster.

Aluminum-Alloy Die Castings—for light weight, easy handling.

Forced Ventilation—for cool running.

Precision-Cut, Heat-Treated Gears—for smooth, quiet power flow.

If you want the *best* for your main-tenance or production work, take an extra look at the PET Superduty Drill shown here. Check its features! Here's a drill that's made for heavy, continuous duty...with *plus* power per pound...built to *work* right and *handle* right on the job.

Normally you might expect to pay ex-tra for such features—in the form of "optionals" that jack up your cost. But that's not true of PET Drills! All these features are standard in the PET Superduty line...and they're available to you at a standard drill price! That's why the coupon below can save money for you. For free catalog and name of your nearest PET distributor, mail it today!

NOW...you can get the RIGHT DRILL for YOUR job!

PET Superduty Drills are avail-able in 54 distinct models and 3 capacities: $\frac{1}{4}$ ", $\frac{3}{8}$ " and $\frac{1}{2}$ ". Your choice of pistol or saw-type grip. With such a broad line, you don't have to compromise on a

drill that's "almost" right! You can choose *exactly* the drill you need for your job. The PET Superduty line includes drills meeting U. S. Government and military specifications.



**Plus Power
per Pound**

PORTABLE ELECTRIC TOOLS, INC.

320 West 83rd Street, Chicago 20, Illinois

In Canada: Portable Electric Tools, Ltd.,
452 Birchmount Road, Toronto 13, Ontario, Canada

MAIL COUPON FOR FULL INFORMATION

PORTABLE ELECTRIC TOOLS, INC. AA-113
320 W. 83rd St., Chicago 20, Ill.

Gentlemen: Please send us free copy of your PET Superduty catalog, and name of nearest distributor.

Name _____ Title _____

Company _____

Address _____

City _____ State _____

Life begins at 40

...for a roofing sheet that's
still going strong



Long-Lasting and Trouble-Free. Monel cap flashings installed on roof of Consolidated Edison Company's Sherman Creek Plant in 1913 are still in good condition.

You might think a roofing sheet would be getting pretty run-down after 40 years.

Well, that's not the case with the roofing on the Sherman Creek Station of New York's CONSOLIDATED EDISON CO.

You see, it's made of Monel®!

This corrosion-resisting Monel job was installed 'way back in 1913. And in all the years since it has been subjected to the most destructive atmospheric elements — blistering heat, icy cold.

Yet, after all the years under such corrosive and abrasive conditions, the Monel roof surfaces, coal hoist siding, downspouts, flashings and skylight frames are still in good condition — still ready for more years of the same tough assignment.

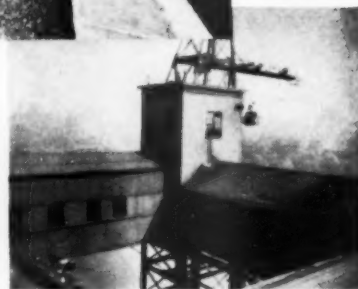
That's why roofers can be glad to see Monel specified today. When a Monel roof goes up, their reputation goes up with it.

They know that it stands firm against strain and flexure — doesn't buckle or crack — resists stresses, wear and abrasion.

Monel is easy to apply, too. It cuts, forms, and solders just as simply and quickly as other roofing metals.

When you want to be sure of satisfied customers, remember that a Monel roof is good for the life of the building. Another thing, too — with Monel you can often help your customers save money by suggesting the use of lighter gauge sheet.

For a helpful booklet on installing Monel, write for your free copy of "Instructions for the Soft Soldering of Monel Roofing Sheet."



Excellent Corrosion-Resistance. Siding, roofing, gutters and leaders are Monel on the Sherman Creek coal hoist. The 40 years of severe service that this installation has seen have had little or no corrosive effect.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street

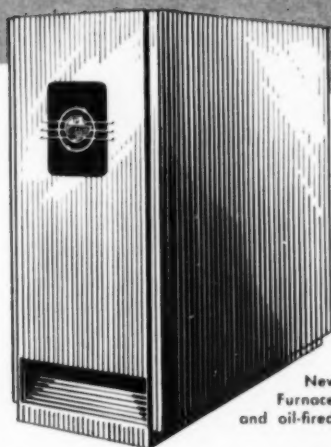
New York 5, N. Y.



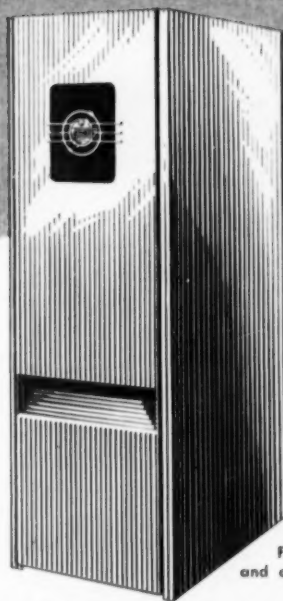
Inco Nickel Alloys

Monel... for the life of the building

MORE "DEALER HELPS" make CHRYSLER AIRTEMP *easier to sell!*



New Lo-Boy
Furnace—in gas
and oil-fired models



New Hi-Boy
Furnace—in gas
and oil-fired models

As a Chrysler Airtemp Dealer you have your choice of the broadest line of tested and proved local selling helps in the entire heating industry. Each one is designed to work for you in your own market over your own name. And each one is so inexpensive to use under liberal terms of the Chrysler Airtemp Cooperative Advertising Plan!

Newspaper Advertising—Mats or electrotypes of hard-selling ads in all popular sizes.

Radio Advertising—Spot announcements in various lengths to suit every requirement.

Television Advertising—Dramatic commercials on film provide for your identification in the beginning and at the end.

Movie Trailers—One-minute films in full natural color for showing in theatres of your choice.

20-Minute Movie—A professionally produced full-color moving picture which dramatizes the benefits and advantages of Chrysler Airtemp Heating and Year

'Round Air Conditioning as realized by a typical American family. For showing before clubs, church groups, builders, contractors, etc.

Direct Mail—Self-mailers, jumbo post cards and many other power-packed features for selling by mail.

Literature—Brochures, folders, specification sheets and other literature on all Chrysler Airtemp gas and oil-fired heating equipment and air conditioning.

Identification and Display—Signs to identify you as the Chrysler Airtemp Dealer and interior displays to focus the prospect's attention on the advantages of Chrysler Airtemp Furnaces.

Consistent national advertising continuously increases the public's acceptance of and preference for Chrysler Airtemp. It makes these powerful selling tools unusually productive for Chrysler Airtemp Dealers locally. But there are many other reasons why you will find Chrysler Airtemp easier to sell! Send convenient coupon now for complete details of this opportunity.

Chrysler Airtemp

HEATING • AIR CONDITIONING
for HOMES, BUSINESS, INDUSTRY

Airtemp Division, Chrysler Corporation, Dayton 1, Ohio



Airtemp Division, Chrysler Corporation
P.O. Box 1037, Dayton 1, Ohio

AA-11-53

Please send full details about the Chrysler Airtemp proposition.

Name _____

Address _____ Phone _____

City _____ Zone _____ State _____

BIG NEWS IN ALUMINUM!

48" Wide Embossed Industrial Corrugated

...For Lower Installed Cost,
Improved Appearance!



All the advantages that have made Reynolds Aluminum Industrial Corrugated a sweeping success throughout industry...rust-proof permanence, lowest maintenance, high insulation...now at even lower installed cost and with improved appearance! With these new 48" sheets, side laps take 30% less metal, 30% fewer fasteners...and there are 30% fewer sheets to handle. With the new stipple-embossed finish, the wider-spaced laps tend to disappear...making a handsome, uniform, textured effect. Call on Reynolds for literature, technical and application details.

Offices in principal cities. Check your classified phone book for our listing under "Building Materials." Or write Reynolds Metals Company, Building Products Division, 2046 South Ninth St., Louisville 1, Kentucky.

DESCRIPTION:

METAL THICKNESS: 0.032 inch (22 U.S. Std. Ga.)

FINISH: Embossed.

LENGTHS: 5', 5' 6", 6', 6' 6", 7', 7' 6", 8', 8' 6", 9', 9' 6", 10', 10' 6", 11', 11' 6", 12'. (Special lengths cut to order subject to inquiry.)

WIDTH: Over all width 48½", nominal coverage 45½", 1½ corrugations side lap.

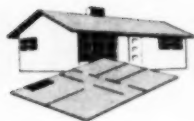
CORRUGATION: Pitch 2.667" center to center, depth ¾", 18 crowns, 18 valleys, one edge up, opposite edge down.

WEIGHT: 56 pounds per 100 square feet of formed sheet.

Standard .032" mill finish Industrial Corrugated also available—35" width, same lengths as above.

REYNOLDS *Lifetime* ALUMINUM INDUSTRIAL CORRUGATED

See "Mister Peepers," starring Wally Cox, Sundays, NBC-TV Network.



When space is at a premium...



THESE COMPACT HORIZONTAL WINTER AIR CONDITIONERS
from the famous SUNBEAM line by AMERICAN-Standard
safely solve your installation problems

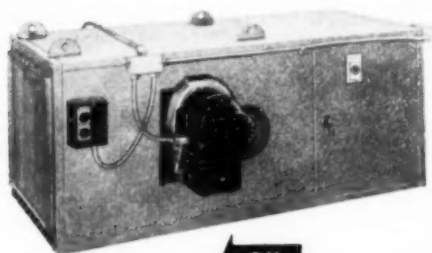
THESE compact winter air conditioners are just what you need for those small and medium size homes where limited floor space makes it difficult to install a conventional type unit.

Their small size and safe construction allows installation in attic, suspended under the floor—in crawl space, utility room or in similar locations. They are also ideal for zone heating in larger homes where more than one unit can be used to advantage.

They are extremely versatile and are adaptable to virtu-

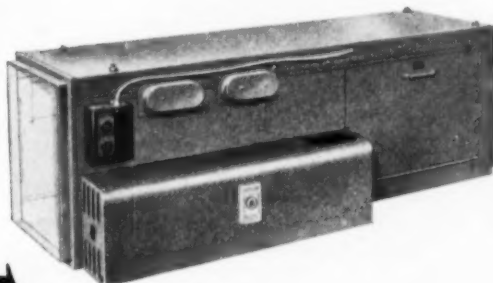
ally unlimited residential applications for perimeter or conventional duct systems. They are well suited for suspended installation in small commercial buildings such as garages and service stations.

For more detailed information on these modern sales makers, including ratings and dimensions, contact your wholesale distributor. **Sunbeam Air Conditioner Division, American Radiator & Standard Sanitary Corporation, Bessemer Building, Pittsburgh 22, Pennsylvania.**



OIL

THE OLANDO is available in three sizes—80,000, 100,000 and 112,000 Btu per hour at bonnet. It is quality-built, precision engineered. Inside of durable metal jacket is protected by corrosion-resistant reflective coating. Heavy steel heating element fired by famous Arcoflame oil burner assures better heating and longer life. Detroit Controls provide trouble-free automatic operation. The Olando is factory-assembled and shipped with wiring harness for quick and easy installation.



GAS

THE PAWNEE is available in three sizes—60,000, 80,000 and 100,000 Btu input per hour. Burns natural, manufactured, mixed and liquefied petroleum gas. Heavy steel heating element fired by efficient slotted type burner is especially designed to provide correct amount of heating surface without hot or cold spots. Inside of jacket protected by corrosion-resistant reflective coating. Detroit Controls provide trouble-free automatic operation. The Pawnee is factory-assembled and pre-wired.



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Executive Offices: Bessemer Building, Pittsburgh 22, Pennsylvania

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Combination SKIL Drill and bench stand yours at less cost than one-purpose tool!



You can have a double-purpose SKIL Drill for less than the cost of a one-purpose drill press. With a SKIL Bench Stand you quickly convert your SKIL Portable Drill into a stationary drill press for production work—for greater accuracy in drilling small parts—for hole saw work. Rack and pinion gearing, heavy base and precision-ground column of SKIL Bench Stand give drill press accuracy—yet SKIL Drill is immediately removable for portable use in any location.

SKIL ½" Drill—Model 80 (at left)—Most widely used SKIL Drill of ½" capacity. Compact, streamlined design. Extra power. Ideal for drilling in metal, concrete, wood.

26 SKIL Drill models have these features

Modern, Compact Design • Helical Gears • Die-Cast Aluminum Housings • Oversize Brushes • Reserve Power • Statically and Dynamically Balanced Motors.

Optional speeds available on many models.

Capacities: ¼" to 1" in steel; 2" in hardwood

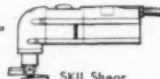
Speeds: 200 r.p.m. to 5000 r.p.m.



SKIL Saw



SKIL Disc Sander

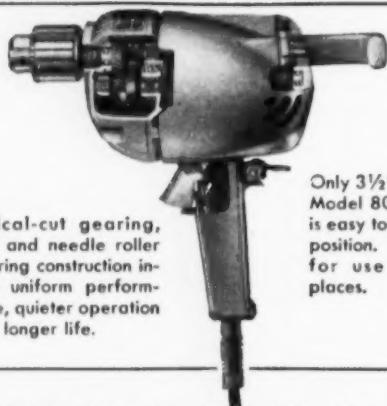


SKIL Shear

SKIL

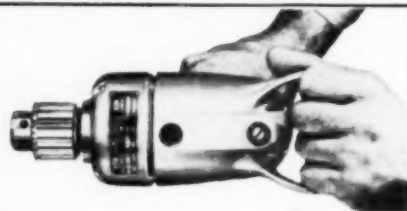
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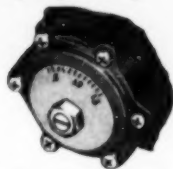
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Turn the dial for any rating and lock hexnut.

Mixes Air and Oil!



Drawer-type assembly with oil and air lines in one easily removed unit.

MODEL E—0.6 to 3.0 G.P.H.

EXCLUSIVE FEATURES

Controls Air!



4-in-1 air-tube disc. Easy to size to nozzle ratings.

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Insures sharp oil cutoff. Prevents smoke and fouling of furnace.

Replaces Any Other!



Universal flange fits 90% of all "package" systems.

One Size Nozzle!



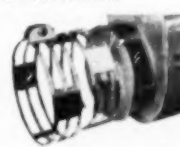
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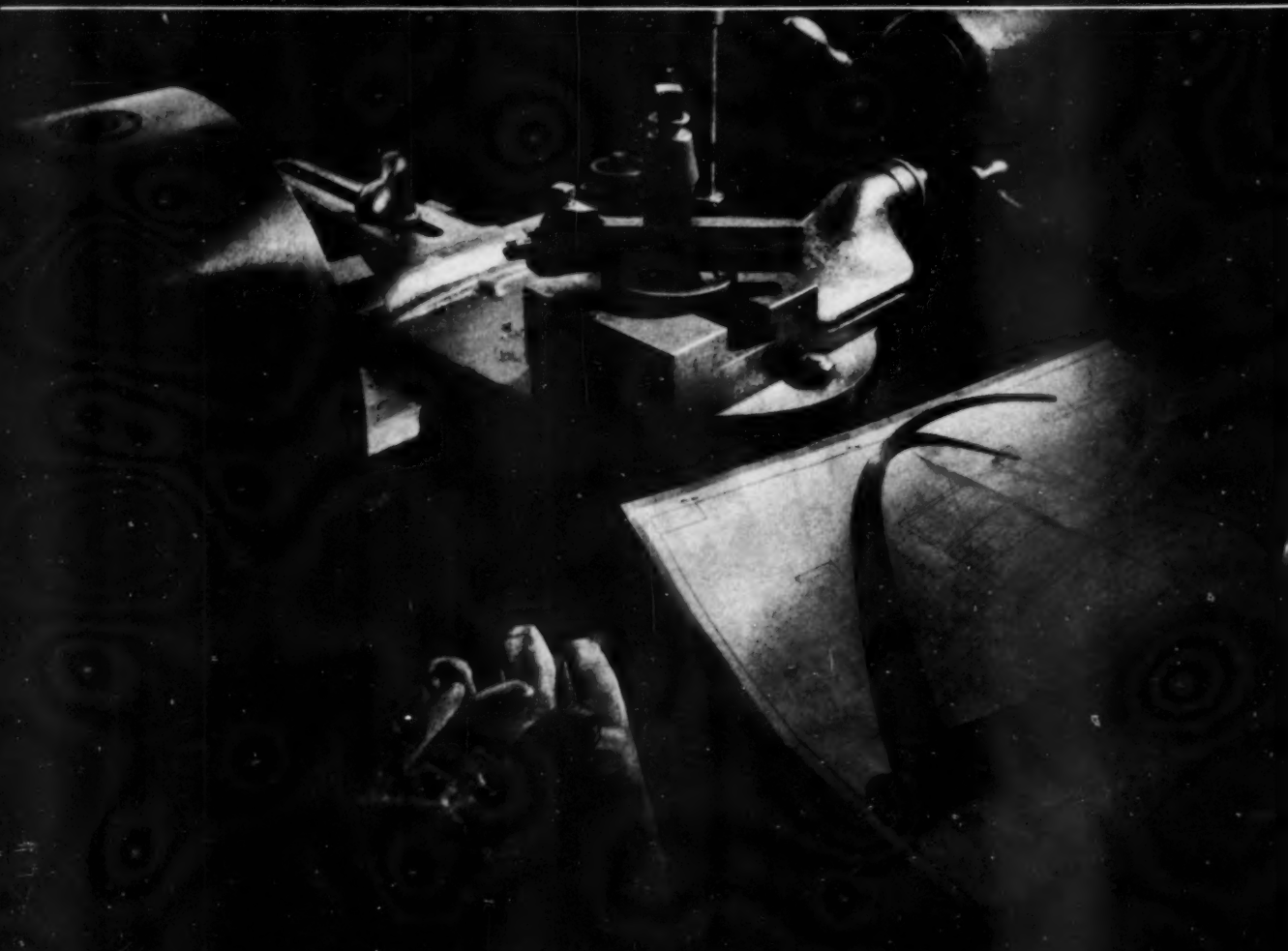
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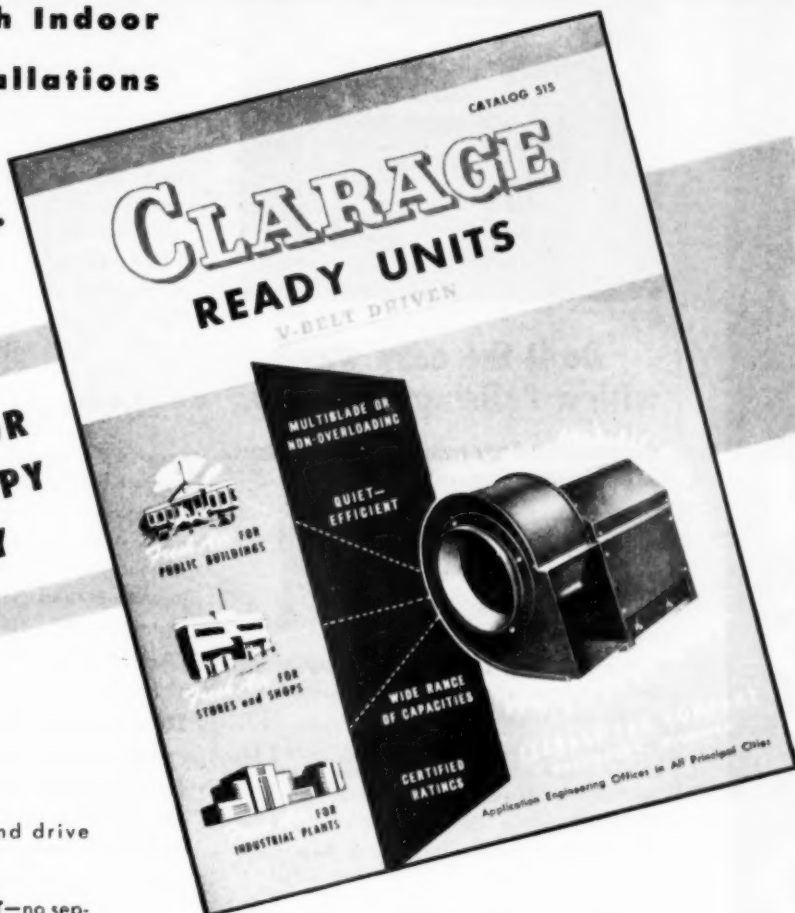
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28 PAGES OF USEFUL INFORMATION enabling you to choose the proper fan equipment for ventilating jobs of all types—supplying process air for production—exhausting gases, fumes, etc. Standard Ready Units are for installations indoors—Ready Units equipped with outdoor covers for installations exposed to the weather. Get acquainted with the many Clamage advantages by writing for Catalog 515.

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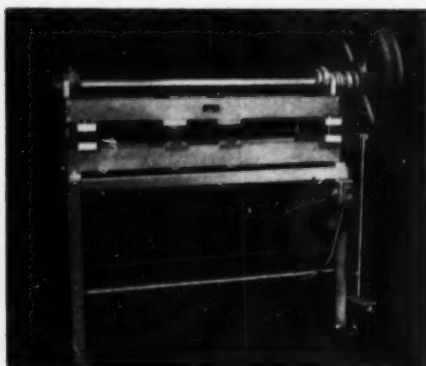
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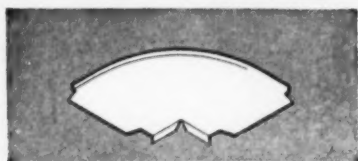
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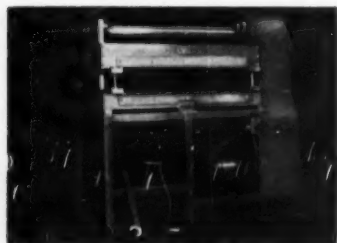
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Manufacturers
SHEET METAL MACHINERY & TOOLS

OIL FIRED EQUIPMENT —

(Continued from page 63)

ferent shaped chamber from that required by a burner giving a long narrow flame. For that reason the suggested dimensions for the various spray angles in common use are shown in the table. Precast chambers are available in round, pear-shaped, and other shapes, and where the proper shape and size is not available to fit into a particular furnace or to fit a particular burner on a conversion job, it may be necessary to build a chamber of brick.

Selecting the Chamber Material

The chamber material is important too. Repeated tests indicate that lightweight firebrick or refractory chambers make a saving of 7 to 9 per cent in fuel cost over the hard brick chambers. These figures are for small domestic jobs. Savings are made possible because the lightweight brick comes up to temperature rapidly and maintains a higher temperature during the operating period. It does not hold the heat and that feature also saves fuel.

Stainless steel chambers will give good results when used in furnaces and units designed for them. There is apparently no clearcut choice between these and refractory chambers when each is properly used. In some installations, the refractory chamber cannot be used because of the space available. There are other jobs which cannot use a stainless steel chamber because of flame impingement and hot spots which cause warping of the stainless steel. Stainless steel must be properly designed and properly installed in order to give satisfactory results.

How to Select Nozzles

The purpose of the nozzle in an oil burner is to prepare the oil for mixing with the combustion air. Nozzles are available in a wide range of spray angles and in two basic types — the hollow cone and the full solid cone spray. This variety of spray angles and types is provided so that the oil spray and the "air spray" may be correctly matched. On some jobs it is rather important in the interests of good efficiency to place the oil spray where the burner normally places the air for combustion. This will insure good mixing and in most cases quiet operation. There are a few cases where the best operation from the noise standpoint will be obtained by using a type of nozzle which does not match the air pattern of the burner. However, in those cases the result will be a decrease in efficiency in the interests of reducing noise and pulsation.

Since oil burner manufacturers usually do not put a tag or label on their burners indicating what spray angle and spray type should be used, the service man must decide, even on burners which are new to him. The ideal way to determine what nozzle to use in a given burner would be to make a plot of the air pattern. That is not a job for a service man, however. Next best is to take a handful of nozzles and a flue gas analyzer on the job

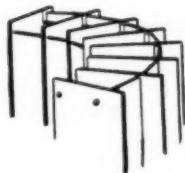
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and spend a few hours trying different spray angles and spray types for maximum efficiency. In the case of the small service organization, however, where the stock of nozzles may not permit a complete choice, it may be necessary to fall back on a few general rules:

1. Some burners cannot use a full cone nozzle. This is true of burners with a hollow cone air delivery. A full cone nozzle may cause pulsation and smoke. These burners are usually also limited to 80 or 90 deg nozzles.

2. Practically all burners can use a hollow cone nozzle if the proper spray angle is selected. For example, if an 80 deg solid cone nozzle is not available for a certain job, very good results may be obtained in many cases with a 60 or even 70 deg hollow cone.

3. If a burner pulsates with a solid cone 80 deg nozzle, and a hollow cone is not available, it is important to remember that the wider spray angles are more hollow. A 90 deg nozzle may do the job.

Nozzle Must Be Properly Serviced

In addition to selecting the proper nozzle for the job, it is essential that the service man make sure the nozzle has a chance to operate as it should. It is necessary to check the oil pressure and make certain that the pressure is 100 psi or higher. It is also necessary to see that the nozzle is properly centered in the combustion head so that the air will not bypass the oil spray more on one side than the other. A proper grade of oil must be supplied so that the spray will not collapse and so that the droplet size will not be too large. In small nozzles, the oil supplied for the unit should never have a viscosity above 40 SSU.

A nozzle can function properly only if it is kept clean. Nozzles must always be kept clean in storage, in handling and while installing on the burner. It is possible to contaminate a nozzle simply by taking hold of the strainer attached to it with dirty, greasy fingers. This dirty grease will squeeze through the screen and cause the nozzle to become contaminated after a short time. A contaminated nozzle causes not only flame failures but off-centered fires which may result in decreased efficiency long before flame failure occurs.

Of extreme importance in protecting the oil burner and the nozzle is the installation of an adequate line filter to filter the oil to the burner. Good filters are available at reasonable cost and no job should ever be installed without one of these filters in the suction line. This filter should be large enough so that the velocity of the oil through it will be low. That will permit the filter to do a good job of filtering and the element will also last longer before it needs to be replaced. Not only should a good filter be installed but it should be checked every year and the cartridge replaced when necessary.

Nozzle filters are available, but these are not designed to take the place of line filters. They have very small holding capacity and are designed to protect the nozzle from contamination during handling and by foreign matter which enters the system beyond the line filter.

Adjusting Oil Fired Units

In the case of oil fired units which come complete from the manufacturer, it is usually not necessary to do any-



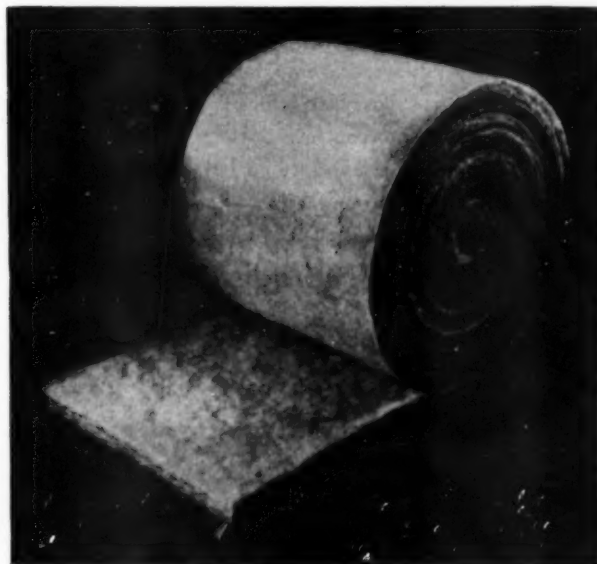
Ultralite Duct Liner, the long glass fiber insulation, has the rugged strength that enables you to acoustically line ducts at the same time you form them! Simply adhere Ultralite to metal before running it through brakes and shears. No danger of ruining the insulation on the truck or on the job, for Ultralite is resilient — won't flake or crumble.



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ULTRALITE is the only duct insulation and duct liner of long, textile-type glass fibers. This "long-staple" strength makes it far easier and cheaper to store, handle, and apply. Ultralite is feather-light, fire-resistant, non-corrosive, non-irritating and will not flake or fall apart under vibration or air movement. It is available plain, or with 6 different facings, already adhered to the insulation.



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thing about the combustion chamber size and shape or the selection of the nozzle. It is essential, however, that the draft be controlled as specified by the manufacturer and the burner be properly adjusted after being installed.

Another possibility for improving the efficiency in those instances is to make certain that the furnace is large enough to handle the job without being forced. It is usually safe to select a furnace slightly larger than that actually required to heat a building. It will then be possible to under-fire the furnace if necessary and still provide enough heat for the job. Under-firing will result in lower stack temperatures and higher efficiency. If this procedure is to be followed, it is recommended that the heat loss be calculated very carefully so that the required furnace size will be known within close limits.

Why Proper Fuel Oil Raises Efficiency

On jobs firing 1.50 gph and up, fuel oil is not too much of a problem. On small jobs, however, particularly under 1.00 gph, the oil has a definite effect upon the efficiency. For example, in one area where the fuel oil was running high in sludge and at or above the maximum viscosity for No. 2 oil, a group of service men told me they had never seen a CO_2 reading above 3 per cent. The chief reason was that with high viscosity fuel in small nozzles, the atomization was not good; that is, the droplet size in the spray was larger than normal. It was therefore necessary to supply more excess air to eliminate smoke. High viscosity oil also causes a reduction in the spray angle of small nozzles. This can cause pulsation in some burners. One way to overcome this is to give the burner more air, but that cure is not recommended.

After encountering the difficulty described above, some service people change to No. 1 fuel oil when firing 0.75 gph or less. The cost per gallon is higher, but so is the average efficiency. Service calls are also reduced and that means lower total heating cost and greater customer satisfaction.

Another cure for high viscosity oil is increasing pump pressure. That has become common practice in some areas.

Sludge in the oil causes plugging of the nozzle and all the oil handling parts of the burner. Judicious use of a good sludge solvent and use of a good line filter will reduce service calls and improve operating efficiency.

[For further information on the performance of oil burner nozzles, see the author's articles in *American Artisan*, July and August, 1952.]

In general, the problem of improving efficiency resolves itself into two rules: 1) Improve the conditions for combustion so that good, clean operation is obtained with a minimum amount of excess air; 2) see to it that a maximum amount of the heat generated by the flame is absorbed by the heating surfaces of the furnace.

The performance of the distribution system also has a bearing on the efficiency of the plant, but that is not our subject here.

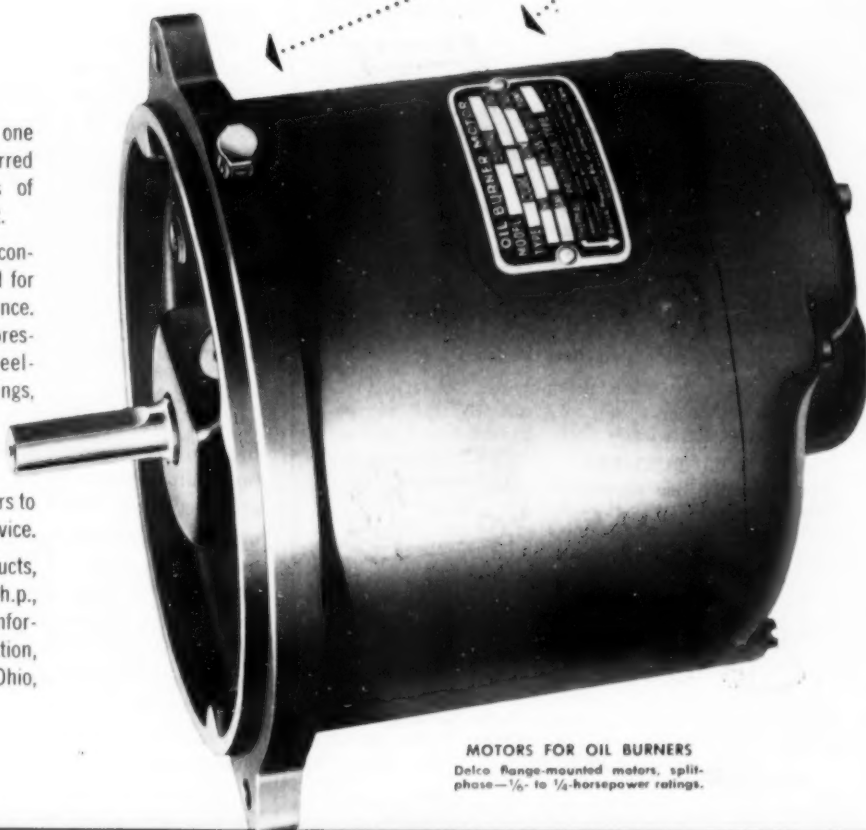
Engineered for DEPENDABILITY

Delco Motors

Careful dynamic balance is only one reason why Delco motors are preferred by many leading manufacturers of heating and ventilating equipment.

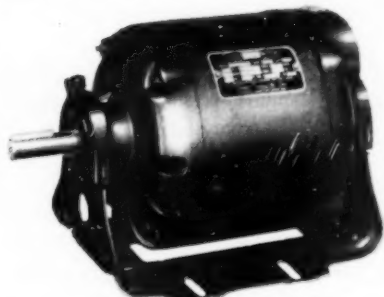
An impressive list of features contributes to Delco's enviable record for continuous, trouble-free performance. These features include uniflow pressure-cast rotor conductors, steel-backed tin babbitt sleeve bearings, cored oil wells, varnish-dipped and baked motor windings. Careful selection of materials, too, is a big factor in enabling Delco motors to give longer, more dependable service.

The motors you need for your products, in sizes from fractional to 100 h.p., are in the great Delco line. For information on motors for any application, address Delco Products, Dayton, Ohio, or our nearest sales office.



MOTORS FOR OIL BURNERS
Delco Range-mounted motors, split-phase— $\frac{1}{6}$ - to $\frac{1}{4}$ -horsepower ratings.

THE BEST RUNNING MATE YOUR PRODUCT CAN HAVE



MOTORS FOR BLOWERS
Delco resilient-mounted motors, split-phase and capacitor-start types, single- and two-speed designs— $\frac{1}{6}$ - to $\frac{1}{4}$ -horsepower ratings.



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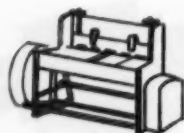
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6 models in cutting lengths from 36 inches through 10 feet, with capacities of 18 and 16 gauge.



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Buy A Wysong . . . It's Miles Ahead

TEMPLATE HELPS DEALER —

(Continued from page 91)

building methods in the past decade. In order to keep industrial and residential building costs within the range of the mass market in this time of high cost of living, every square foot of floor area must be carefully allocated to an important function. In an effort to keep cost down, present construction has been streamlined — ceiling heights have been lowered, competition has forced closer construction costing, mass production or project building has been born, basements have been finished off for living space, closet space has been reduced — and, of course, space for air conditioning equipment has been reduced.

How has this change affected the manufacturers and installers of heating and cooling equipment? In order to aid the architects and builders, equipment dimensions are being reduced to the practical limit. Heating equipment is being designed for safe installation on combustible floors in closets and alcoves with minimum clearances from unit to wall. From a comfort standpoint, units are being manufactured in smaller capacity steps, so that equipment may be more closely sized to the installation.

Template Reduces Error

With building costs running \$10.00 and up per sq ft of floor area, the actual positioning of the air conditioning unit becomes very critical. The first time conditioning equipment and building are tied together is on the architect's drawings or blueprints. A position for the unit must be selected and the dimensions must be scaled to the floor plan. This work may take place on the architect's drawing board or in the air conditioning dealer's or contractor's establishment. The dealer must show a prospective client or architect on his first call how his equipment will fit into the building scheme which has been proposed.

Human error is great in scaling unit sizes, which may involve fractions of an inch, onto a floor plan. An error of 1/16 in. increases to 3 in. on a 1/4 in. = 1 ft scale. On the same scale, the width of a heavy penciled line can be equivalent to 3/4 in.

An aid in the rapid and accurate scaling of the unit size to a floor plan is the new year 'round air conditioner equipment layout template — a 51 1/2 by 101 1/2 in. plastic template with blocks cut out to a 1/4 in. = 1 ft scale for an entire line of standard gas and oil furnaces, home cooling units, and year 'round air conditioner combinations.

The template may be moved around the plan, and several possible unit locations and positions can be considered and discussed, with the result that the most suitable location for the equipment will be selected.

In addition, the device has been so designed that no particular engineering skills are required for its manipulation.

★ ★ ★

Manufacturers' Agents

*Are you interested in
securing additional lines?*

We are occasionally asked by our manufacturer advertisers to suggest the names of manufacturers' agents in various sections of the country whom they can contact in regard to representation of their warm air heating, residential air conditioning and sheet metal products.

If you would like your name listed on our records for inquiries we may receive on your territory, we invite you to write us. There is no charge in connection with this service.

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Especially designed for warm air residence furnaces this low-cost Glycolator is a fast seller — a big profit maker. You can install it *easily* and *quickly* — on existing and new heating systems.

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**Save
Time and Money
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AIR TURNING VANES**

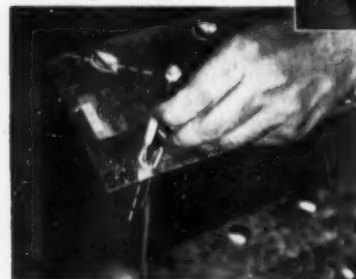
**with ... "DURO
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RAIL"**

**Installed Cost cut
50% to 75%**

**Here are the
3 easy steps**

1 Shear Vanes from scrap. (No tabs to cut). Roll to form arc (approximately a quarter circle). Place Vane in "Slot" in Duro-Vane-Rail.

2 Place chisel at angle designated. One hammer blow cuts and bends the protruding part of the Vane in the "slot" to form permanent, rigid lock (Duro-Lock).



3 Note how, with one blow on chisel, the part of the Vane protruding into the "slot" has simultaneously been cut and bent over to form a permanent, rigid lock. NO RATTLE. When Vanes have been secured to top and bottom "Rails", simply fasten completed assembly in the Elbow.



This is how finished Vane Assembly looks installed in Square Elbow.



**Saves You
Time and Money**

- Greatly reduces Assembly Time.
- Shear Vanes from scrap (no tabs).
- Eliminates layout.
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ASSOCIATION NEWS —

(Continued from page 113)

Three Sheet Metal Groups in Joint Meeting

THE SECOND annual joint meeting of the governing boards of the Carolinas Roofing and Sheet Metal Contractors Association, the Roofing and Sheet Metal Contractors Association of Florida, and the Roofing and Sheet Metal Contractors Association of Georgia was held at the Sheraton Beach Hotel, Daytona Beach, Fla., with the Florida association acting as host.

The meeting opened with welcoming addresses by presidents Steve Raymond of the Florida association, I. C. Mock of Georgia, and William T. Fort of the Carolinas. Other speakers included A. J. Sabathne, president, Sheet Metal Contractors National Association, whose subject was sheet metal problems; C. C. Figge, executive secretary, the National Roofing Contractors Association, who spoke on up-grading the roofing business; and Charles H. De Laughter, who discussed business administration.

Reports on the activities of the three associations were presented by W. M. Jones, Sr., of Georgia; E. L. Scott of the Carolinas; and Frank Tack of Florida. Following this, the meeting was thrown open for general discussion. Major subjects of the open discussions were: the advisability of requesting specification writers to provide that general contractors specify the names of subcontractors in preparing bids; sales taxes as applied in the various states; insurance coverage; lien laws now in effect; and relations with suppliers.

The meeting closed with a discussion relative to holding a third meeting of the three governing boards, with the Carolinas association acting as host.

Stoker Manufacturers Hold Annual Meeting

THE ANNUAL meeting of the Stoker Manufacturers Association was held in Cleveland at the Hotel Cleveland and Westwood Country Club on October 1. Management, sales and engineering executives representing stoker manufacturing firms, suppliers and allied industry organizations attended the meeting.

Business sessions at the Hotel Cleveland, starting with a breakfast meeting, featured open forum discussions on several phases of the industry's operations and problems — mainly sales and merchandising programs.

Officers re-elected are: president, L. C. Dubs; vice president, B. O. Fink; and secretary-treasurer, H. B. Scoville.

California Contractors Discuss Labor Relations

SPEAKERS at the October meeting of the Institute of Gas Heating Industries (Los Angeles) were Carl Gould, attorney for the association, and Sam Jaffe. Mr. Gould discussed the relationship between labor and the law. Mr. Jaffe, assisted by Dick Thunes, presented facts about the codes governing heating installations throughout southern California.

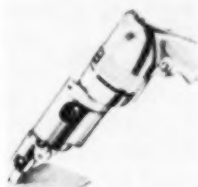
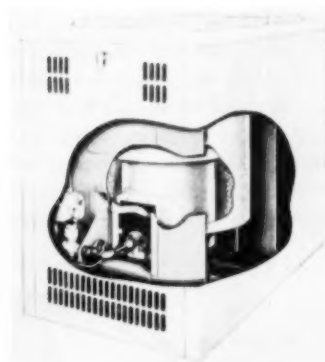
EQUIPMENT DEVELOPMENTS —

(Continued from page 117)

stroke of the ram. When the operator presses the foot switch, the ram descends and stops. When he releases it and presses it again, the ram follows through to the end of the stroke and returns to top position automatically. The sheet can be removed while the ram raises itself. Double clutching is accomplished by flipping a switch.

Lowboy Winter Air Conditioner

SERIES 531 gas fired steel lowboy winter air conditioners available in five sizes in a range of from 55,000 to 158,000 Btu output at the register — Thatcher Furnace Co., Centre St., Garwood, N.J. The 55,000, 70,000, and 87,000 Btu models are shipped completely assembled and pre-wired, requiring thermostat, electrical and gas connections. The burner is a single port, upshot type, AGA approved for city gases.



Above: Saw Attachment
Left: Winter Conditioner

Saw Attachment for Drills

"E-Z Cut" DRILL ATTACHMENT for 1/4 in. portable electric drills, which locks to the drill housing nose and converts the drill into a power saber saw for heavy duty work on a variety of metals, woods, plastics, etc. — Jaco Devices Co., 98 High St., Hingham, Mass. With the attachment, the drill becomes a portable power saw with one hand control. Because the attachment is locked to the housing, it removes excessive radial stresses from the drill chuck and spindle, the company states. It is designed for rapid installation and removal, without the use of special tools or alteration of the drill. The attachment is suitable for drills having an rpm of 1700 to 3000 and an amp power rating of 1.7 or more.

Residential Heat Pump

TYPE HP residential heat pump in 3 and 5 hp models — Westinghouse Electric Corp., 200 Readville St., Hyde Park, Boston 36. It provides heating, cooling, dehumidification, ventilation, circulation, and continuous cleaning of the air. The unit depends solely on air as its exchange medium, drawing heat from inside air and discharging it outside in the summer, and drawing heat from outside air in the winter. The reversing cycle is completely automatic, a simplified transfer valve for

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This view of part of the C. P. Blouin Co., plant is a fine example of a modern sheet metal shop. Modern, too, in their Damper construction... they use "Duro-Blade-Kit" Damper Hardware.

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ENGINEERED
**DAMPER
HARDWARE**

**SAVES YOU
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- Can be used on the heaviest Dampers.
- Corrosion-resistant materials.
- Fits 3 inch blade or wider. Can be screwed, bolted, riveted, welded or spot-welded.

WRITE for Free Demonstration Kit and illustrated Manual on the construction of "Approved" Dampers



Model shows how either parallel or opposed blade action is accomplished.

Mfgs. of "Duro-Vane-Rail," "Duro-Blade Kit," "Greyhound" Portable Spot Welders and A. C. Arc Welders

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38 SOUTH FRANKLIN STREET, HEMPSTEAD, L. I., N. Y.

equipment developments . . .

refrigerant flow control being used. When connected with a wall thermostat, the heat pump automatically switches from heating to cooling and vice versa. A special metering tube eliminates the need for expansion valves and check valves. Installation involves connecting of electric power lines, a condensate drain, and supply and return air ducts. The smaller size requires 10 sq ft of space.

Two-Capacity Furnace

"GASAVAR DELUXE" two-capacity furnace — Williamson Heater Co., 3529 Madison Rd., Cincinnati 9. It is designed to cut fuel input by half on mild days, operating at full capacity only during the few severest days in the year. An outdoor thermostat controls operation, switching the "Twin-Temp" burner to half fuel input and cutting the blower to half speed when weather warrants. As a result, overheating is eliminated, flue losses are reduced, and gas and electric costs are cut, the manufacturer states. Btu ratings range from 63,750 to 176,000 maximum Btu output.

Ignition Transformer Replacement Kit

KIT FOR IGNITION transformer replacements on standard oil burners — Magnex Corp., 90-28 Van Wyck Express-

way, Jamaica 18, N.Y. It contains two standard transformers, three interchangeable mounting bases, eight fastening screws, two studs for stud mounted transformers, two rajah adapters and two spring clip adapters.



Impact Press

ALL-PNEUMATIC impact press designed to provide uniformity of impact force on work pieces varying considerably in thickness, speed up to 10,000 complete cycles per hour, and operator safety — Heidrich-Nourse Co., 631 E. 3rd St., Los Angeles 13. Operation is on the principle of a variable stroke air hammer or piston-ram which moves within a closed cylinder and strikes a chuck projecting through the bottom of the cylinder. Length of the hammer stroke or travel inside the cylinder is adjusted by the large hand nut at the top, which changes the position of the inner cylinder head. When the foot

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Generals are easy to sell because customers need GF's positive filtering protection.



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- Heavy Steel Body Welded Cabinet
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Exclusive Hacker stainless steel combustion chamber makes possible this *speedy temperature pickup*. No fire brick used. Faster combustion actually *lowers fuel bills*. Gives *more even* temperature. In addition chamber permits use of *any* nozzle from 1/4 to 1 gal. without changing size of chamber. **ALL PARTS ARE STANDARD AND EASILY OBTAINED FROM ANY RELIABLE SUPPLY HOUSE** Hacker has an *amazingly low cost* obtained by specializing in *one* furnace and *one* size.

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LOW PRICED TO MEET
TOUGHEST COMPETITION

equipment developments . . .

valve pedal is pressed, the cylinder assembly with chuck and tool is brought into contact with the work by a hydraulic traverse mechanism and impact follows. On work of uniform thickness, the clearance height of the tool above the work may be as low as 0.005 in. On other work, the clearance may be set for the thickest piece. Originally designed for use in aircraft and related industries, the press recently has been made available to the sheet metal industry.

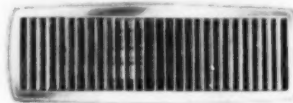
Direct Drive Blowers

LINE OF DIRECT drive blowers for forced warm air furnaces and air conditioning equipment — Morrison Products, Inc., 16816 Waterloo Rd., Cleveland 10. Blowers, designed for compactness, feature a rigid motor bracket for mounting the motor resiliently. They are available in two sizes of housings and with either 1/12, 1/8, or 1/6 hp shaded pole motor. Speed control is available as optional equipment.

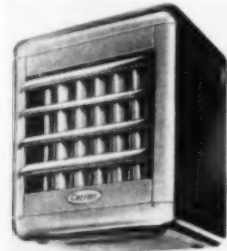
Floor Diffuser for Perimeter Jobs

NO. 42 FLOOR DIFFUSER for perimeter installations — Air Control Products, Inc., Coopersville, Mich. The one piece face is designed with seamless corners. A thin counter-operating valve with curved vanes is intended

to give lower resistance and better control of the air pattern. The curved vanes are factory set, but can be adjusted to other settings with a pair of pliers. The diffuser can be used with either slab floor or basement construction. It is available in four sizes — 10 × 4 in., 12 × 4 in., 14 × 4 in., and 14 × 21/4 in.



Above: Floor Diffuser



Right: Unit Heater

Gas Fired Unit Heater

GAS FIRED unit heater designed to combine high capacity with compact design — Carrier Corp., 302 S. Geddes St., Syracuse. It is 23 in. high, less than 23 in. deep (including fan and motor assembly), and 19 1/2 in. wide. Capacity is 50,000 Btu per hr. The unit is suitable for spaces where headroom is at a premium. Gas is fired directly in the tubes of an all-welded heat exchanger made of 16 gage corrosion resistant aluminized steel. This material will withstand temperatures up to 900 F without discoloration and up to 1600 F without destructive scaling, the company states. The unit is AGA approved for use with all types of gases.

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Gravity Warm Air and Return Air Fittings
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Perimeter Heating System
Small Pipe High Velocity System

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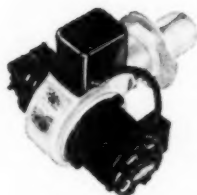
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The Excelsior Steel Furnace Company
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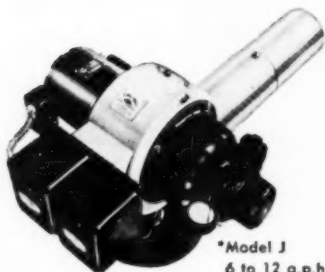
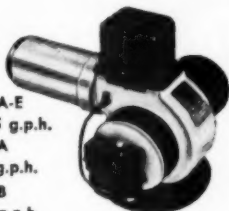


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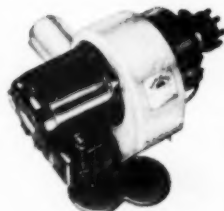


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*Series "5" Burners with
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mounted and wired. Avail-
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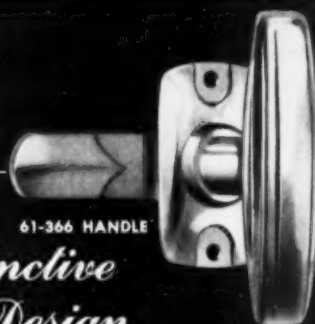
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Round Head Screws on 1-1/2" centers. Finished
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Here's the way to provide for modern, automatic oil delivery. Guarantees accurate, no-spill fills day or night, whether customer is at home or away.

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A variety of models for new and old tanks.



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A modern convenience in every way. Big figures readable at first glance. Face adjustable to any angle. Built for accurate, service-free operation. Specify tank depth when ordering.



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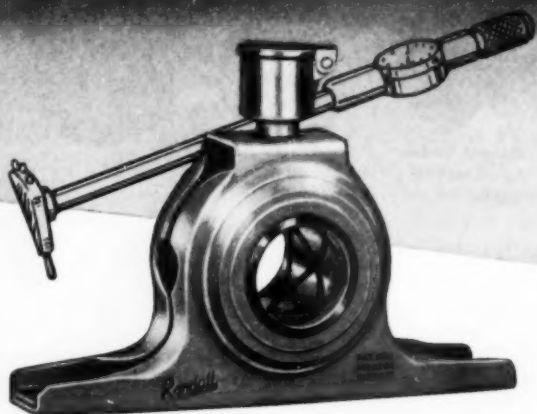
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Randall bearings are available for shaft sizes from $\frac{1}{2}$ " to $3\frac{1}{8}$ " inclusive in one-piece steel or two-piece cast iron housings; in flange type housings from $\frac{1}{2}$ " to $1\frac{1}{8}$ ". For more detailed information write for catalog No. 109 today.

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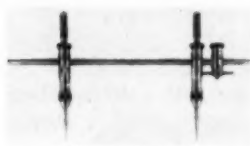
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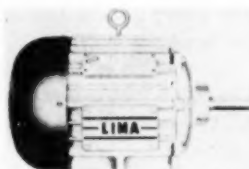
equipment developments . . .

Steel Beam Trammels for Layout Work

SERIES 180 STEEL beam trammels designed for use in layout work, scribing, and measuring — The Lufkin Rule Co., Saginaw, Mich. Free turning knurled grips on top of each tram make the tool more convenient to use, the company states. Trams will not turn once set, as the top of the rigid beam is flattened. Spring friction prevents the trams from sliding off the beam when the clamping nuts are loosened. The trammel beams are 10½, 14½, and 20 in. long. With a 20 in. extension beam, circles up to 72 in. in diameter can be scribed with the 20 in. trammel.



Above: Trammel
Right: Motor



Totally Enclosed Motor

TYPE E totally enclosed, fan cooled motor in ratings of ¾ hp at 900 rpm, to 20 hp at 3600 rpm, in NEMA frame sizes 224 to 326, inclusive — The Lima Electric Motor Co., Dept. 10, Lima, Ohio. Features include cast iron frames with integral feet, integrally cast fins, double width pre-lubricated sealed ball bearings, and a cast aluminum fan designed to provide high velocity air over the cooling fins, preventing collection of dust, dirt, etc. Motors can be supplied for vertical, wall or ceiling mounting as well as standard horizontal floor mounting.

Warm Air Space Heater

"PARAFLO" OIL FIRED warm air space heating unit in models with 200,000 and 250,000 Btu per hr output — Heating Dept., Machinery Div., Dravo Corp., 1203 Dravo Bldg., Pittsburgh 22. The unit is completely automatic and equipped with a UL approved gun type oil burner. It shows an efficiency in excess of 80 per cent, the company states, resulting from the two pass flame travel in the stainless steel combustion chamber and passage of the hot gases through an economizer section. Supporting straps hold the combustion chamber in position whether the heater is mounted vertically or horizontally, one end being free to move as the metal expands and contracts. The air circulating fan takes in air at floor level, directs it around the combustion chamber, through the economizer section, and out through two directional nozzles which can be rotated 360 deg. The heater operates on 110 volt, 60 cycle, single phase power, and burns up to and including No. 2 fuel oil.

Ridge Type Ventilator

IMPROVED "RIDGOLATOR" ridge line type ventilator designed to give complete ventilation through all types of

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HUMIDIFIER

USING A CENTRIFUGAL ATOMIZER

— for WARM AIR FURNACES!

The new *Walton*
MODEL WF



OVERALL
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11½ IN.

Only WALTON provides —
**Automatic, Trouble-Free
Operation with Positive
Moisture Output**



Evaporating capacity is better than 3 gallons of water per day. Water vapor is produced by means of a centrifugal mechanical atomizer which eliminates the use of jets, splash plates, evaporation plates or other troublesome parts. This new Walton Model WF can be connected to humidistat control for complete automatic operation. Adaptable to all warm air duct systems.

Consistent with our policy of maintaining the highest standards for quality and performance, this model is manufactured of only the finest grades of non-ferrous materials and using exclusive Walton patents.

Only WALTON offers —

Real Humidification for any Type of Heating System

Write today for information on Walton portable room models and literature on the Model WF, the first truly effective humidifier for warm air furnaces.

WALTON LABORATORIES
INCORPORATED
IRVINGTON 11, NEW JERSEY
Chicago Branch Office, 30 No. LaSalle Street

SPECIALISTS IN AUTOMATIC MOISTURE CONTROL EQUIPMENT
HUMIDIFIERS AND DEHUMIDIFIERS

equipment developments . . .

farm buildings — The Klauer Mfg. Co., 9th and Washington Sts., Dubuque. Installed the length of the roof, the ventilator establishes a normal outlet for excessive heat or moisture laden air. It is also designed to provide equal air distribution by maintaining a constant, smooth pull throughout the entire length, preventing hay and grains from becoming soggy.

Portable Space Heaters

FIVE NEW models in "Sonic-Ray" portable space heaters — The Bica Co., 1170 N. State St., Girard, Ohio. The Model T is rated at 85,000 Btu and is thermostatically controlled, with automatic safety shutoff. It is designed for unattended operation. The Model W is a combination water and space heater rated at 85,000 Btu input with a capacity of 100 gph at 125 F. The AGA approved models AD, AF, and AT are rated at 50,000 Btu input and may be used for permanent or semi-permanent installation.

EQUIPMENT BRIEFS

No. 620 CAULKING COMPOUND supplied in tape form, with a thread core designed to prevent stringing out or sagging when the tape is unrolled — Products Research Co., 3126 Los Feliz Blvd., Los Angeles 39. Primary

application is joint sealing against moisture, wind, dust and cold. It is placed between two surfaces, after which light pressure is applied and the compound distributes itself throughout the joint. It withstands a temperature range of -25 F to 250 F, the company states.

LIQUID SOLDERING FLUX designed to require a minimum of heat — The Tinit Mfg. Co., 1635 Platte St., Denver 2. The flux is available in 8 oz bottles. Each drop is sufficient to tin 1 sq in. of new metal, the company states.

"CRYSTALGLAS" automatic gas fired domestic hot water heater with a new glass lining possessing rust and corrosion resistant qualities — Bryant Heater Div., Affiliated Gas Equipment, Inc., 17825 St. Clair Ave., Cleveland 10. The heater tests at 400 lb per sq in. hydrostatic pressure, the company states.

PORTABLE MOTOR WELDER equipped with a self-contained motor generator — Generator Sales Co., 1627 N. Damen Ave., Chicago 47. The machine welds, brazes, grinds, sands, polishes, buffs, brushes, supplies power from the power unit and charges batteries.

"FYR-KOTE" OIL BASE fire retardant interior flat wall paint — Morris Paint & Varnish Co., 27th and Douglas Sts., Omaha. Applied by brush or spray, it stops fire from spreading. The paint is UL listed.



NEW

SUSPENDED FURNACES

2 SIZES — 80,000 and 112,000 BTU
OIL BURNING ONLY

VOLUME BUYERS!
GET OUR
**SENSATIONAL NEW
PRICE SCHEDULES**

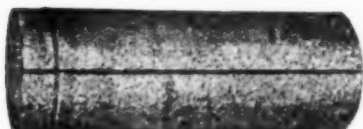
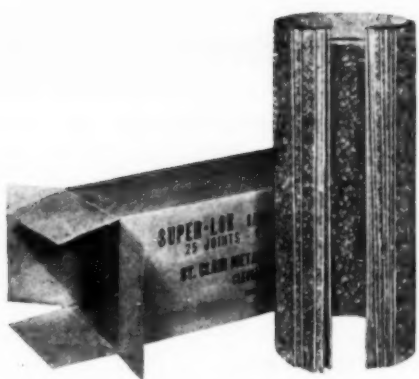
J.V. PATTEN COMPANY
SYCAMORE, ILLINOIS, U. S. A.

**NEW
ADDITION
TO THE
COMPLETE**



LINE
10 BASEMENT UNITS
10 HIBOY UNITS
3 GRAVITY UNITS
OIL OR GAS

**Write
TODAY**



Stock up *NOW* with...

SUPER-LOK

finest quality Galvanized SNAP LOCK
PIPE and FITTINGS

Packed in CARTONS for your convenience, Super-Lok is your greatest value in furnace pipe and fittings! It locks easier, quicker...holds tighter...provides dependable, long-lasting service for all types of installations—gravity, forced air, air conditioning! Standard gauges and sizes. Order Super-Lok now and be ready for the big demand!

NEW! PACKAGED for easy handling!
GALVANIZED FERRULES FOR GUTTERS

Packed in handy cartons of fifty. Eliminates hand counting. Finest quality galvanized steel ferrules, in 4", 5" and 6" sizes. Order today!

St. Clair METAL PRODUCTS CO.

6700 Central Avenue • Cleveland 4, Ohio • Henderson 1-5678

MAKERS OF NATIONALLY-FAMOUS SUPER-SHEEN CHROME PIPE AND FITTINGS

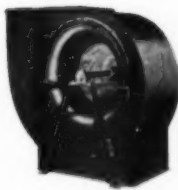
NO FINER LINE-UP FOR PLANT CLEAN-UP



ELECTRONIC AIR CLEANING—
New Westinghouse PRECIPITRON® Oil Mist Control unit efficiently collects coolant mists generated during machining operations. Send for Catalog TC-1400.

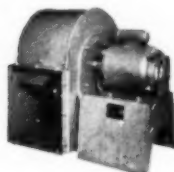


INDUSTRIAL FANS—An efficient new General Purpose Fan, requiring smaller motors, is available on short delivery. Three wheel types for fumes, gases, metallic dusts, chips, shavings, or long stringy materials. Four arrangements for integral or separate motor drive, belt or direct-connected. Send for Catalog 1150.



CAST IRON VOLUME FANS—
Sturdy fans designed for severe industrial exhausting applications or furnishing air blast. Noted for trouble-free low-cost service under toughest conditions. Send for Catalog 1130.

For data on the full Westinghouse line, ask for General Catalog 600, or call your local Westinghouse-Sturtevant office.



UTILITY SETS—Low-cost V-belt and direct driven models available from stock. Sturdy, quiet centrifugal fans, easy to install for air supply, ventilation and fume exhaust. Send for Catalog TC-1160.

Westinghouse Electric Corporation
Sturtevant Division
Hyde Park, Boston 36, Massachusetts

Please send me a free copy of General Catalog 600.

Name _____

Company _____

Title _____

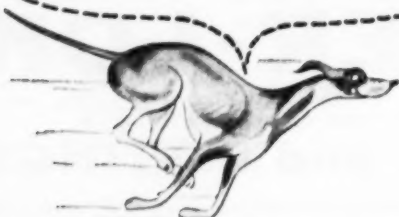
Address _____

City _____ Zone _____ State _____

YOU CAN BE SURE...IF IT'S **Westinghouse**

AIR HANDLING

**Here's why AGITAIR
FM AIR FILTERS are so
doggone popular!**



High velocity...highest efficiency.



1/3 less space required.



Lower installation and maintenance costs.



Long serviceable life.

Designed for an approach velocity of 530 fpm over the net media area, the high filtering efficiency of the AGITAIR FM increases as the dust load is applied. You save 1/3 in space required, in number of units to be installed and serviced. Very large dust-holding capacity of AGITAIR FM assures longer service periods, fewer cleanings per year, lower service charges. No exposed wire ends to cut or damage hands of service operators. Compare. Send today for free Cost Comparison Chart.



AIR DEVICES INC.
185 Madison Avenue, New York 16, N. Y.

FILTERS • AIR DIFFUSERS • EXHAUSTERS

new literature . . .

Oil and Gas Fired Heating Equipment

CATALOG SECTION AA presents a complete line of heating equipment — Wayne Home Equipment Co., Inc., 801 Glasgow Ave., Fort Wayne 4. Included are illustrations, specifications and descriptions of oil burners and furnaces and gas burners and furnaces, available in a wide range of sizes and types.

Glass Fiber Filtering Medium

CIRCULAR describes glass fiber filtering medium which the manufacturer states can be bent or shaped to any form without losing its filtering efficiency, thus eliminating the need for a standard size filter — Amer-glas Div., American Air Filter Co., Inc., 215 Central Ave., Louisville. The medium is available in unframed pads cut to size or in rolls.

Merchandising Aid for Heating Dealers

FORM J.S. 204 (16 pages) answers questions on heating and air conditioning frequently asked by home owners and prospective home owners — Janitrol Div., Surface Combustion Corp., 2375 Dorr St., Toledo 1. Descriptions of various types of heating systems, with sections on modernizing and year 'round air conditioning, are intended to make the booklet useful to heating dealers who are explaining to their prospective customers the types and merits of various heating systems.

Solenoid Valves

DATA SHEET M-500-T describes construction features and operation of "DO" solenoid valves — Eclipse Fuel Engineering Co., 1001 Buchanan St., Rockford, Ill. Keyed diagrams show closed and open positions. Specifications, prices and dimensional data are included.

Blower Assemblies

AN ENGINEERING handbook of blower assembly data, designed for use by manufacturers and designers of residential heating and cooling equipment, gives step-by-step information needed to select the proper belt-driven blower assembly to fit the design and capacity of a heating or cooling unit — Viking Air Conditioning Corp., 5601 Walworth Ave., Cleveland 2. A scale template of motor and mount and drawings of various blower scrolls are designed to provide a fast method of determining the best motor location to fit a particular plan. The template also shows clearance dimensions of an installed blower and the proper belt length for the specified motor location.

Ventilating, Air Conditioning Filters

BULLETIN 600 (8 pages) describes "Staynew" ventilation and air conditioning filters — Dollinger Corp., 11 Centre

new literature . . .

Park, Rochester 3, N. Y. Included are specifications, engineering and performance data, also a section showing installation procedures.

Electronic Controls

INFORMATION on electronic controls for ventilating systems is presented in Catalog F 6166 (8 pages) — Barber-Colman Co., 1101 Rock St., Rockford, Ill. The catalog contains complete descriptions of the various elements required for system application and illustrates their usage.

Replacement Bodies, Bases for Oil Burners

SERIES 10 replacement ignition transformer bodies and interchangeable bases for oil burners and water heaters are covered in a four page circular — Dongan Electric Mfg. Co., 2931 Franklin St., Detroit 7. Illustrated are base terminals, both screw and plug-in type, also end terminals of both types. Transformer bodies are shipped with bases selected. Additional bases can be purchased separately if desired.

Welding Equipment

THE RECENTLY developed "Fillerarc" consumable-electrode gas-shielded welding process is covered in three bulletins — General Electric Co., Schenectady 5. Bulletin GER-819 is a reprint of a paper presented before the American Welding Society. It contains information on the developments and experiments undertaken in the design and manufacture of the equipment. GEA-6028 contains description and application information and design features of the welder. GEC-989 provides descriptive data on the equipment as well as operating information, specifications and dimensions.

Horizontal Hole Punching Units

SELF-CONTAINED type "H" horizontal hole punching units are illustrated and described in catalog H (8 pages) — Wales-Strippit Corp., 345 Payne Ave., North Tonawanda, N. Y. These units are designed to punch holes in curved and straight flanges, rims and angles and similar shaped and formed work. Holes can be punched in the side of the work instead of on top of flat surfaces because units are so designed that the punches move back and forth horizontally.

Perforated Metals for Industrial Applications

A COMPLETE LINE of round, square, oblong and ornamental perforations is described in Catalog 39 (36 pages) — Diamond Mfg. Co., 243 W. 8th St., Wyoming, Pa. The perforations range in diameter size from 0.02 in. to 9.5 in. Information on sizes, open areas, gage limits, etc., is included. The perforations are illustrated, as are a variety of industrial, architectural and ornamental applications (louver type grilles for heating, etc.).



**Shed those
design
shackles,
specify**

AGITAIR

You can give free rein to your creative planning and still rely on AGITAIR square and rectangular diffusers to provide draftless air distribution from any location. Custom-designed, with built-in diffusing vanes, in a wide variety of louvered patterns, they provide blows in 1, 2, 3 or 4 directions without use of blank-offs. AGITAIR diffusers need not be centrally located in an area if such placing does not agree with the decorative motif, or if a beam or other obstruction is in the way.

Moreover, AGITAIR square and rectangular diffusers are now available with or without removable, interchangeable cores. AGITAIR also brings you Stripline, the slender, continuous air diffuser with unlimited application versatility.

New 34-page Type R Catalog reveals how correct air distribution is simplified by AGITAIR. Contact your local AGITAIR representative, or write us direct for your free copy.



AIR DEVICES INC.
185 Madison Avenue, New York 16, N. Y.

AIR DIFFUSERS • FILTERS • EXHAUSTERS

"I SELL JANITROL BECAUSE ...

Other dealers told us
about Janitrol's trouble-
free performance.
Our own experience
proves it."

Statement by Mr. W. A. Schuette,
Manager, Hausgas, Incorporated,
leading heating contractor of
Washington, Missouri.

● Before starting in the heating business, Hausgas was told by others about Janitrol's long record of durable performance. But today their enthusiasm for selling Janitrol comes from the trouble-free records of the hundreds of installations they have made themselves.

Mr. Schuette knows that selling is easier because of this Janitrol record, and . . . "because", he says, "the customer has a complete choice of automatic equipment for warm air, steam and hot water heating." He also says that "Janitrol offers the best helps for the dealer, that is, layout, figuring heat loss."

This tribute again shows why "Janitrol is easier to sell than sell against."

An authorized Janitrol dealership
may be open in your territory.
Write for complete information.



Janitrol
Automatic Heating



SURFACE COMBUSTION CORPORATION • TOLEDO 1, OHIO

we hear that . . .



BENJAMIN ABRAMS, president, Emerson Radio and Phonograph Corp., receives congratulations from Samuel L. Peters, president, Quiet Heat Mfg. Corp., after the signing of the contract which gave Emerson majority control of the Quiet Heat firm

EMERSON RADIO and Phonograph Corp. has acquired a majority interest in Quiet Heat Mfg. Corp. In addition to producing its own line of room and house air conditioners, Quiet Heat will now produce room and house air conditioners which will be marketed under the Emerson name. The new line will be exhibited to the industry early in December.

THE CINCINNATI SHAPER CO. has shipped the first machine turned out by its new Whitewater shop, located west of Cincinnati on the New York Central Railroad. The new shop is 650 ft long by 160 ft wide. The company plans to erect a machine shop and an office building to complete the consolidation of manufacturing facilities

SURFACE COMBUSTION CORP. is conducting two national advertising campaigns in consumer and business publications, one directed to the home builder and one to the public. The public campaign stresses the importance of careful attention to good heating and the builder campaign shows the builder how he can capitalize on this theme in his everyday selling. Brochures are being sent to home builders throughout the country explaining how the company will cooperate with its local dealers in advertising programs designed to publicize an individual builder as one whose houses feature good heating systems.

INLAND STEEL CO. has prepared a picture story, showing the role of steel in free nations throughout the world, which is being mailed to 18,000 of its employees and to local libraries and schools. The 62 page booklet shows how steelmen live in France, Germany, Japan, Great Britain, and other countries.

EXTENSIVE REVISIONS have been made by the Department of Public Utilities, Richmond, Va., in its Rules and Regulations for the Installation, Maintenance and Use

NOW even the Smallest Shop can SLASH SHEARING COSTS

with the fast new
precision-engineered

WILDER JUNIOR METAL SLITTER

- No gadgets to fool with
- No other expensive equipment tied up ● Trouble free
- Speed 73.3 fpm. Wt. 118 lb. Tolerance .005"

Features 2 power driven, hollow-ground edge, high carbon, high chrome tool steel blades
Oil impregnated porous bronze bearings

Specifications

Speed of cut—73.3 feet per minute
Gage capacity—20 gage mild steel and lighter
Horsepower—1/3 — 110 V — Single phase — 60 cycle
Shearing Width—1 1/4" to 24 1/4" to any length
Length—Front to back—38" Width—less gage overall—28"
Width—head frame—8 3/4" Width—gage length—40"
Height—overall 43" Height—to shear line—36"
Weight—net—118 lb. Weight—crated—138 lb.



For complete information ask your jobber
or write

Route 2 Box 880
Carmel, California

WILDER
WILDER
MANUFACTURING CO. INC.

BRANDES WALL BASE HEATING *for*

FORCED WARM AIR SYSTEMS . . .

*. . . blankets the wall
with an even flow of heat
for maximum Living com-
fort!*

Brandes wall base heating for forced warm air systems is modern . . . low in cost . . . easy to install . . . highly efficient! Its original design insures that the air flow blankets the wall with an even flow of heat. Write today for complete information.

BRANDES COMPANY

2046 Winnebago

MADISON 4

WISCONSIN



Get **BRANDES***
WALL BASE HEATING

***The FIRST, and Patented**

For Every Type of
Installation
In Every Type
and Size of Home

HANDY

Furnace Pipe
And Fittings
Are Tops In
Design and Ac-
curacy of Fit.

In Use Since 1892

Send for Catalog No 53

H. Meyer & Bro. Co.
Peoria Illinois



What Machine-Cast (Castomatic®) Solder Means to YOU...

It means that you can now get a bar solder that works faster, easier and better because it is made in enclosed molds, out of contact with air, on patented, electronically controlled machines.

Ordinary bar solder is hand-cast in open molds.

Castomatic solder of a given analysis always melts at the same temperature. Flow is uninterrupted, work easier. It has no hard spots; no voids to cause sputtering, no segregation to make melting uneven.

Federated research and field service men work constantly with hundreds of items of non-ferrous origin. What they know and learn about each of these helps to make Castomatic solder and every other Federated product the best that man and science can produce...

helps make Federated
"Headquarters for Non-ferrous Metals."



Federated Metals Division

AMERICAN SMELTING AND REFINING COMPANY
120 BROADWAY, NEW YORK 5, N. Y.

In Canada: Federated Metals Canada, Ltd., Toronto, Montreal

Aluminum and Magnesium • Babbitts • Brasses and Bronzes • Anodes
Die Casting Metals • Lead and Lead Products • Solders • Type Metals

we hear that . . .

of Piping, Appliances and Fittings for Gas. Principal changes are: 1) The question of gas pressures has been clarified; 2) the responsibility for payment of the cost of relocating gas meters has been outlined; 3) the interior trap door requirement for floor furnace installations has been eliminated; 4) the detailing of conversion burner test requirements has been omitted and installer's responsibilities have been outlined; and 5) the requirements for domestic incinerator installations have been listed.

THE NEW ENGLAND sales office of American Nickeloid Co. has been moved to 250 Boylston St., Boston 16.



FOUR EMPLOYEES of the Nu-Way Corp., who have been with the company for a total of 106 years, were guests of honor at the 25-year anniversary party

THE NU-WAY CORP. recently gave a testimonial dinner at the Plantation Supper Club, Moline, Ill., to honor four employees with 25 years or more of service. Each employee was given an anniversary model of a 400 day clock.

SUPERIOR METAL FABRICATING Co. has developed a system utilizing bright colors to quickly identify the gage of "Spee-D-Lok" furnace pipe, elbows and angles. Green labels identify 24 gage; yellow, 26 gage; blue, 28 gage; and red, 30 gage.

WESTINGHOUSE Electric Corp. plans to build a packaged air conditioning plant near Staunton, Va. The plant will be operated by the company's air conditioning division, headquartered at Hyde Park, Boston. After completion, the plant is expected to provide employment for more than 500 persons.

NATIONAL distribution of Appton "Super Hammers" has been taken over by Merchandising and Mfg. Associates, Inc., 53 N. Duke St., Lancaster, Pa.

THE AUTOMATIC Control and Uni-Flo Divisions, Barber-Colman Co., have opened two new factory branch offices,

NEW

here's what you've been looking for . . .

more profits with this International

Economy

horizontal furnace

Oil and gas models available in space saving designs with wide installation flexibility

Call your International Economy distributor today . . . there's EXTRA profits for you in these new horizontal furnaces which can be installed almost anywhere — basement, utility room, attic, even crawl space under homes! It's tomorrow's furnace for your sales today.

- Shipped factory-assembled
- Oil sizes — 84,000, 112,000, 168,000 Btu output
- Gas sizes — AGA input — rating of 60,000, 80,000, 100,000 Btu's
- Alternate filter positions
- Beautiful smooth-enamelled cabinets

International Heater Company

Dept. A-11, Utica 2, N. Y.

Western Warehouse — Chicago, Illinois

111 years of heating experience at your service



Shown here is the smallest size Model OS-80E. These oil units carry our famous TEN-YEAR WARRANTY on heating element and casing!

"Most Valuable"



in
PRODUCING
SALES

Sundstrand
All Electric
OIL BURNER

Such integral values as design, construction and performance give the Sundstrand line selling power backed by consumer acceptance.

The public hears about Sundstrand. They see Sundstrand. They buy Sundstrand.

Because: Ultimate heating satisfaction means having an oil burner with

- ★ DURABILITY
- ★ DEPENDABILITY
- ★ COMPACT DESIGN
- ★ OVERALL ECONOMY
- ★ QUIET OPERATION

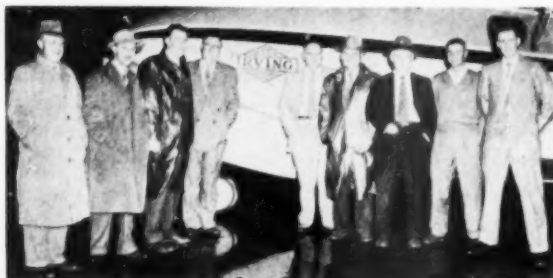
These salient features result from 32 years of engineering and development by Sundstrand. Available is a complete line of oil burners for new installations or conversion. To increase *your* sales with Sundstrand,

write to —

SUNDSTRAND ENGINEERING CO.
ROCKFORD, ILLINOIS

we hear that . . .

one at 1537 Central Ave., Indianapolis, and the other at 1245 S. 13th St., Omaha.



ARRIVING at Moncton to attend the Boston Machine Works Co. meeting are (l. to r.): H. Earl Thompson, A. James Nagle, Cy Adcock, I. M. Nelson, Ralph L. Dennis, Fred Zwansig, Carl Mould, Freeman M. Fleming (pilot), and Arthur Irving

STEEL AND ENGINE Products, Ltd., Liverpool, N. S., factory representatives in the Maritime provinces in Canada for the Boston Machine Works Co., recently sponsored two meetings for oil heating men—one at the Admiral Beatty Hotel, St. John, N. B., and the other at the Nova Scotia Hotel, Halifax, N. S. A total of 130 oil burner men attended the two meetings. Representing Boston

WEBCO

the portable

SHEET METAL BENDING BRAKE

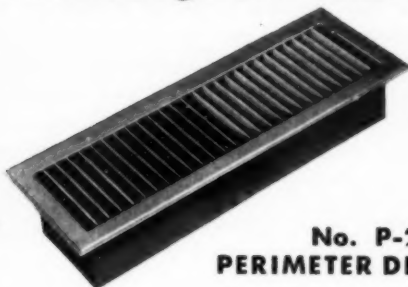


The WEBCO brake offers the Slip End, Sliding Folding Fingers, and many other important features. The WEBCO will make bends up to 52°. Write for detailed information to:

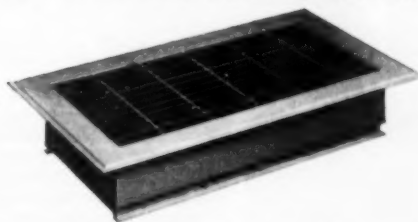
HALLMOR INC.

McMURRAY ROAD
BRIDGEVILLE, PA.

Presenting two brand new additions to the A&A line...



Developed
by
George G. Auer



No. P-28 PERIMETER DIFFUSERS

A new popular style register for concrete slab, basementless type home installation. Designed so that air is diffused efficiently in a 100° arc.

Order in neutral Metallic or blended Oak Finishes.

No. F-20 FLOOR REGISTERS

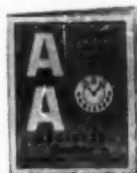
Here is a strong and durable floor register that's designed to please the most discriminating home owner and the most exacting home builder.

Now available from our stock in three types of finishes, Metallic, Prime, or Oak.



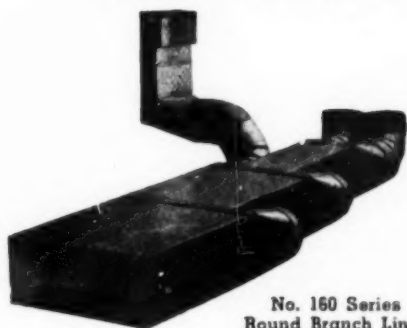
Your best buy
every time

Write for your copy of the A&A Register Catalog 53 for sizes and prices of all of the styles in our *Complete Line* of wall and floor registers.

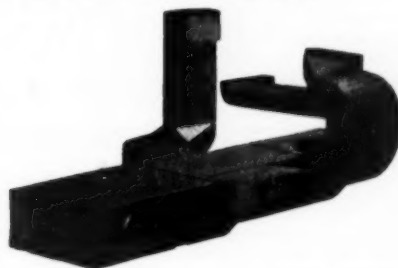


THE A & A REGISTER COMPANY
8327 CLINTON RD. CLEVELAND 9, OHIO

GRAY "Snap-Rite" FURNACE PIPE AND FITTINGS AIR CONDITIONING PIPE AND FITTINGS



No. 160 Series
Round Branch Lines



No. 170 Series
All Square Lines

A complete line of Gravity and Forced Air Pipe and Fittings with our positive "SNAP-RITE" Lock for quick assembly and erection. Wall Stack and Fittings in 3 1/4" standard depths. Truck Pipe and Fittings in 8" standard depths.

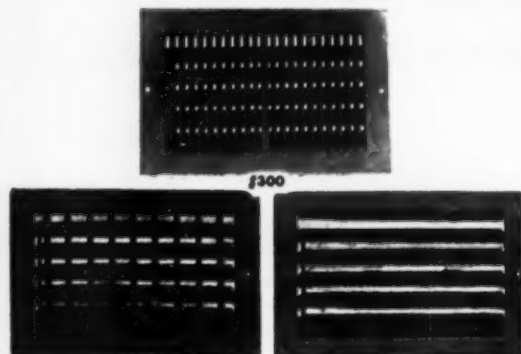
Write for Catalog

GRAY METAL PRODUCTS, INC.

30 Carlton Street

Rochester 7, New York

See Your Jobber



Many thousands of the above types used in housing projects. Lowest in price, more free area.

The Air-O-Vane ceiling diffuser. Also made in type D-R with positive shut-off control (Patents Pending) made in all sizes.



Greatest in free area of any ceiling diffuser and lowest in cost. Write for catalogue or see your jobber.

AIR-O-VANE CEILING DIFFUSER
WRITE FOR CATALOGUE TO —



KRUEGER
AIR CONDITIONING COMPANY

19 EAST RILLITO ST. TUCSON, ARIZONA

we hear that . . .

Machine Works Co. at the meetings were Ralph L. Dennis, manager, and I. M. Nelson, national field representative, Oil Heating Supplies Div. In addition, several special meetings were held at branches of the Irving Oil Co., located in St. John, N. B., Charlottetown, P. E. I., Campbellton, N. B., Moncton, N. B., New Glasgow, N. S., Liverpool, N. S., and Halifax, N. S. To save time in traveling between the various points — some of which were a few hundred miles apart — the group took advantage of the offer made by K. C. Irving to use his private plane.

YEAR 'ROUND air conditioning equipment, including a Chrysler Airtemp gas fired warm air furnace and a 3 hp water cooled residential air conditioner, was recently installed in a 40 year old, eight room frame house in Nutley, N. J. Total cost of the installation was \$1980.

The company's air cooled air conditioning systems are being featured in a new housing development near Muncie, Ind. Two-bedroom homes in the development will sell for \$8600.

ECLIPSE FUEL ENGINEERING Co. has recently acquired the Solenoid Valve Div. of Wheaton Engineering Co. The purchase includes complete production equipment, patents, engineering drawings, etc.

It's the **LOW DOWN** DIRT trapped by **WILSON'S HAIR FILTERS** that **GUARANTEES LONGER LIFE**

In Wilson Hair Filters the entire dust-holding capacity is completely utilized. This means, no surface dust stopping only, but Full-Depth Dust Trapping at its best . . . and many extra months of filter life.

The reasons are so simple:

1. The hair media in Wilson Hair Filters act in the same manner as Mother Nature's proven way of filtering the air you breathe. It's the hair that cleans the air . . . more easily, more effectively, more economically.
2. The multi-directional distribution of the hair in Wilson Hair Filters literally invites all dust and dirt to come in and be trapped throughout the entire filter interior.
3. Most brands of air filters require oiling on their inlet surfaces. This stops dust prematurely, loads up the incoming air side and materially shortens filter life.

Wilson Hair Filters are not oiled on the inlet side. Instead, they receive an even distribution of mineral oil on their outlet surface, which:

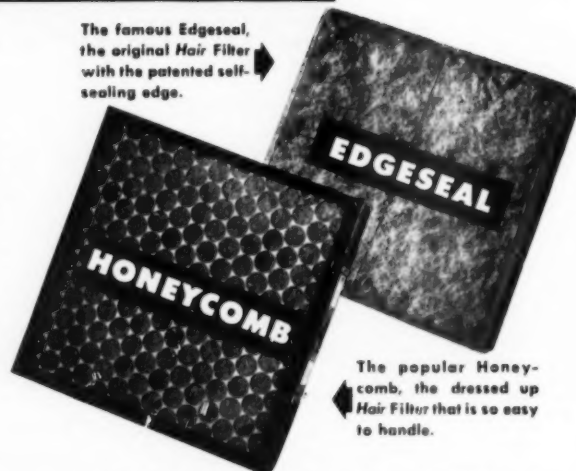
- (a) augments the already amazing ability of the hair itself, to catch and hold dust, and—
- (b) builds an impregnable barrier which halts dust and dirt after reaching the furthestmost practicable penetration point.

WILSON & CO., INC.

(Air Filter Division) 4100 South Ashland Ave., Chicago 9, Ill.

Wilson Hair Filters are another quality product of Wilson & Co., world-famous for meat products, sports equipment, pharmaceuticals, hair products, etc.

The famous Edgeseal, the original Hair Filter with the patented self-sealing edge.



The popular Honeycomb, the dressed up Hair Filter that is so easy to handle.

Save delay. Save dollars. Save doubt. Send for FREE sample with details and prices.



**CUSTOM BUILT—
QUANTITY PRICED**

atlas

BOILER JACKETS

YES, Atlas combines highest quality with lower costs by using basic styles and eliminating tooling costs. You can get boiler jackets custom built to your specifications from ATLAS at prices that will surprise you. ATLAS offers three flush type boiler jacket styles to meet manufacturers' demands. All are of heavy gauge steel, with baked enamel finish, ready for quick installation. You'll find them all the last word in appearance and value.



ECONOMY

Square type construction is featured in this model. In spite of its fine appearance Economy is competitive in price. Ideal for large scale housing projects where price is a major factor.



QUALITY

The richness of the round-cornered top is combined with the simplicity and economy of the square-cornered body. This style is competitive in price with all standard construction designs.



DELUXE

This fully round-cornered design is Deluxe in every way. The full radius on all corners lends massiveness and beauty to its expensive appearance. Use Deluxe for your select dealer trade at surprisingly low cost.

Atlas also manufactures cabinets for heating, cooling and air conditioning units, and furnace cabinets of any style. We will be glad to quote cost estimates on any type of boiler jacket or cabinet on receipt of your specifications and requirements.

**Atlas MANUFACTURING
COMPANY**

EUSTIS AT ROBBINS ST. • ST. PAUL 4, MINN.

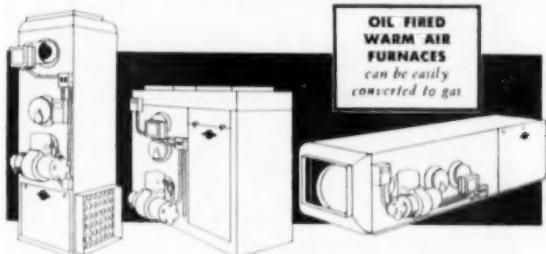
**YOU ALSO GET THE
BIG SIZES
in the BESSER line!**

A COMPLETE RANGE OF SIZES . . .

from 75,000 BTU to 500,000 BTU

A COMPLETE LINE OF MODELS . . .

*Horizontal • Vertical • Basement
Downflo • HiBoy • LoBoy • Suspended*



Plus SPECIAL ORDER SERVICE
on any size unit UP TO 1,000,000 BTU

For jobs that require units larger than 500,000 B.T.U., Besser offers fast, reliable Special Order Service. We have the facilities to build any type unit required, up to 1,000,000 B.T.U. output. Every "special order" is built to the same high standards of the regular Besser line. Whatever your need, we can build it!

And now! **A NEW PROFIT-MAKER
JOINS THE BESSER LINE**
Revolutionary

**HORIZONTAL Summer
AIR CONDITIONERS**

for Residential or Commercial installations

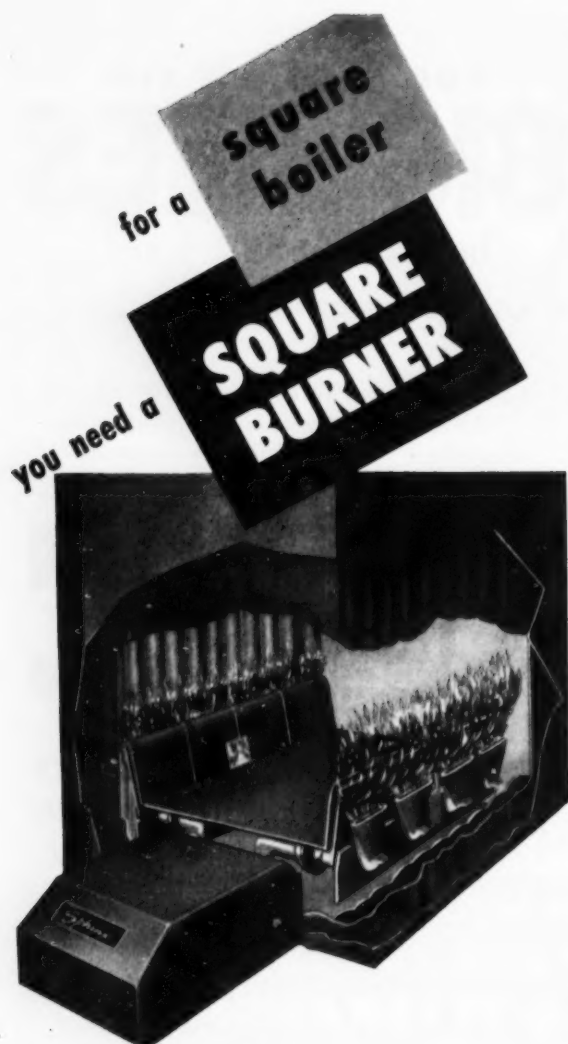
Combining space-saving "horizontal" design with an entirely new cooling principle, Besser Summer Air Conditioners bring central air conditioning within the reach of almost everyone. Designed for installation and operation in conjunction with central heating systems, units are fully adaptable to either warm air or hot water heating. Greatly increased efficiency lowers initial and operating costs through use of smaller units.

Available in 2, 3 and 5-Ton units.

"Only the BEST goes into a BESSER!"

BESSER **WARM AIR FURNACES**
Summer AIR CONDITIONERS
The Complete Line for Year-Round Profits

BESSER METAL PRODUCTS CORP., P. O. BOX 4064, CHARLOTTE, N. C.



C. L. BRYANT'S

Sphinx GAS CONVERSION BURNERS

There is a correct Sphinx Custom-Built Gas Conversion Burner for every type of domestic and small commercial heating plant.

Whether it's round or square...for warm air...hot water...or steam, Sphinx is the ideal Gas Conversion Burner for both Dealer and Customer. Sell Sphinx and get more sales and installations! Increase your Profits with Sphinx Burners. Give your customers genuine heating comfort and satisfaction. Built for a life-time of trouble-free service, Sphinx Conversion Burners minimize service calls and maintenance headaches! Write or phone today for the C. L. Bryant Sphinx Sales and Profit Plan.

C. L. BRYANT CORP.

2720 E. 79th STREET, CLEVELAND 4, OHIO

Makers of Famous Sphinx Gas Home Equipment

Chicago Sales Office and Warehouse:
404 LAKE STREET, OAK PARK, ILLINOIS

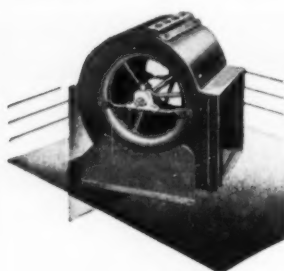
we hear that . . .



T. R. BRICE, retiring after 42 years of service with L. J. Mueller Furnace Co. is flanked by Harold P. Mueller, Sr., president, and Harold P. Mueller, Jr., vice president

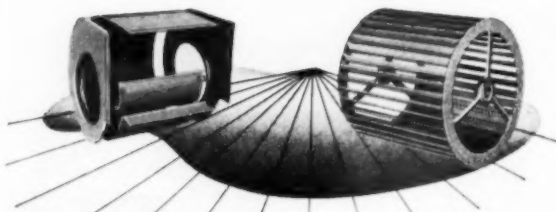
TOM R. BRICE, who has been with L. J. Mueller Furnace Co. since 1912, retired on September 30. He began as a traffic manager, then became a city salesman until 1917 when he entered the armed services. Upon his return, he resumed his duties as sales engineer.

D. G. Spahr, sales engineer for the company, is teaching a class in heating and ventilating for small buildings in the evening extension division of the University of Wisconsin, at Milwaukee.



MASSACHUSETTS AIR CONDITIONING FURNACE BLOWERS

Designed for manufacturers of warm air furnaces and air conditioning equipment.
Wheel Sizes 7½" to 27"



Housing sides, cutoff plate and scroll sheet. Heavy gauge steel stampings.

End spider suspension type wheel assembly.

Write for catalog

Manufacturers of centrifugal blowers for 36 years

MASSACHUSETTS BLOWER DIVISION

The BISHOP & BABCOCK Mfg. Co.

4901 HAMILTON AVENUE

CLEVELAND 16, OHIO

MAXITROL does many things much better IN THE FIELD OF GAS PRESSURE REGULATING

MAXITROL
—first in perfecting high capacity gas pressure regulators with the now-famous "Straight-Thru-Flow" principle . . .
—first in the development of a modern appliance regulator incorporating a non-metallic seat . . .
—first in imaginative engineering for creative product development . . .
MAXITROL pledges continued advancement in the gas pressure regulator field—your guarantee of greater efficiency for your product at lower cost!



MAXITROL
COMPANY
formerly
DETROIT REGULATOR CO.

12200 BEECH ROAD

• DETROIT 28, MICHIGAN

Sold on the Pacific Coast by: PACIFIC SCIENTIFIC CO.
San Francisco, Los Angeles, Seattle, Portland

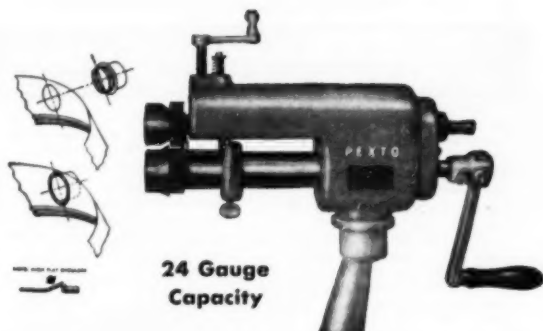
Tomorrow, as yesterday, you may look to
MAXITROL for engineering and
product leadership

The New

PEXTO

No. 621

FURNACE COLLAR EDGING MACHINE



24 Gauge
Capacity

Standard machine is furnished with the new Furnace Collar Edging Rolls. These new collar edging rolls raise a high flat shoulder and crimp the collar edge.

The crimped collar edge can then be easily hammered down against the bonnet or plenum to form an air-tight, whistle-free joint on either type A or type B collars . . . no notching necessary.

Furnace collar edging rolls available for your present 620 and 621 machines.

THE PECK, STOW & WILCOX CO., Since 1785, SOUTHTON, CONNECTICUT, U.S.A.



ARE YOU GETTING YOUR SHARE OF THE TERNE METAL ROOFING BUSINESS?

There are lots of dollars lying around—dollars you can pick up by selling Follansbee Terne Metal Roofs, and by using Follansbee Terne Metal for your roof repair jobs.

To help you get this profitable metal roofing business, Follansbee is maintaining a consistent sales promotion and advertising program. *But*, it's up to you to go after these roofing contracts—it's up to you to tell your customers about the many advantages of Follansbee Terne Metal—

- how tightly and permanently it seals the weather outside where it belongs,
- how it protects against fire,
- how it resists high winds, and extreme temperature,
- how the color of the roof can be changed to match exterior trim.

...and here's more good news—40 lb. coated Follansbee Terne Metal Roofing is available once again in convenient 50-foot continuous seamless rolls for every roof and weathersealing need. Now you can get your share of these profitable metal roofing contracts in every kind of housing. If you're not getting your share, perhaps we can help you.

FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES, PITTSBURGH 30, PA.

COLD ROLLED STRIP SEAMLESS TERNE ROLL ROOFING
POLISHED BLUE SHEETS AND COILS

Sales Offices—Chicago, Cleveland, Detroit, Indianapolis, Kansas City, Los Angeles, Milwaukee, Nashville, New York, Philadelphia, Rochester, San Francisco, Seattle; Toronto and Montreal, Canada. Mills—Follansbee, W. Va.

FOLLANSBEE METAL WAREHOUSES
Pittsburgh, Pa. Rochester, N.Y. Fairfield, Conn.



we hear that . . .

An assistant chief engineer in the nationalist Chinese government's arsenal on Formosa and an engineering trainee from India were among a group of five who recently toured the company's plant at Milwaukee. Particular interest was expressed in the mass production techniques used.

THE HEATING DEPARTMENT headquarters of the Machinery Div., Dravo Corp., are now located in the Chamber of Commerce Bldg., 411 7th Ave., Pittsburgh 19.

THE 410 FT aluminum skyscraper built by Aluminum Co. of America in Pittsburgh was recently dedicated. More than 7500 guests of the company have toured the building.

Roy A. Hunt, chairman of the executive committee, was recently presented with a diamond-studded lapel button signifying 50 years' continuous service with the company. The presentation was made by I. W. Wilson, president.

A. O. SMITH CORP. has opened a new welding electrode plant at Lancaster, Pa. The factory provides floor space amounting to approximately 41,000 sq ft.

THREE REGIONAL meetings have been planned by U. S. Machine Div., Stewart-Warner Corp., to discuss merchan-

Convert Gravity Furnaces With A CIRCULATAIRE Bonnet Blower



CIRCULATAIRE ELIMINATES COLD ROOMS, BALANCES HEAT DISTRIBUTION, SAVES FUEL

CIRCULATAIRE solves the problem of "hard to heat" rooms, boosts warm air quickly through all the heating pipes. CIRCULATAIRE is easily and quickly installed without removing the bonnet. Packaged unit includes motor and fan control. No new sheet metal work required, no changing of cold or warm air pipes, no baffles to be built. The CIRCULATAIRE is rigid, quiet and efficient in operation.

NOW READY—New CIRCULATAIRE Sales Aids add effectiveness to selling interview, conserves valuable selling time and increases sales.

A COMPLETELY PACKAGED UNIT
Nothing for the dealer to furnish except limited amount of labor.



GET THE FACTS TODAY! WRITE...

CIRCULATAIRE DIVISION OF CORLETT-TURNER CO.
1001 S. KOSTNER AVE., CHICAGO 24.

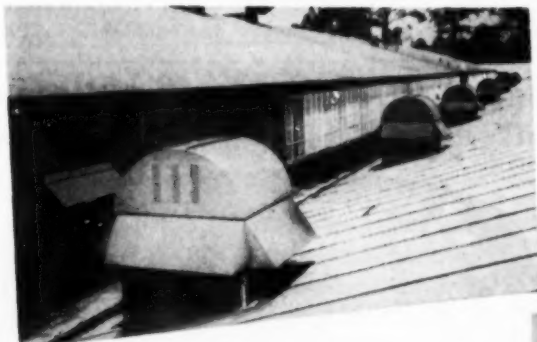


KNOWS AIR MOVEMENT . . .

. . . CHOOSES

PENN VENTILATORS

*For Efficient and Economical
Ventilation of Office & Plant Facilities*



• More than thirty Penn Ventilators exhaust air from the office and mammoth shop facilities of Piasecki Helicopter Corp. in Morton, Penna.


You, too, can depend on Penn Ventilators to make conditions more favorable in your plant. There is a type and size to accommodate most general ventilation requirements. Call the Penn Ventilator man in your area or write . . .

Complete
Literature
Available
— Write
Engr. Dept.



Representa-
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Distributors
in Principal
Cities

PHILADELPHIA 40, PENNA.

FOR MORE THAN 25 YEARS THE BUILDERS'  TOP LINE

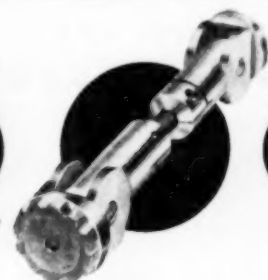
THIS IS IT!

**LAY OUT ANY PATTERN IN A
FEW MINUTES WITH THE NEW
JET PATTERN DEVELOPER**

SAVES

TIME
MATERIAL
LABOR
SPACE

MONEY



ONLY

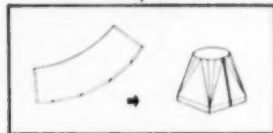
\$69.50

COMPLETE
WITH 30
TEMPLATES

With the Jet Pattern Developer any mechanic can quickly and easily layout Square to rounds, Cones, Elbows, Intersections, Wye Branches, Register Booths, Dormers (any pitch), Transitions, Three piece transitional elbows round to square and thousands of other complex patterns. In fact we haven't found a pattern yet that can't be laid out in a few minutes time with this amazing new tool.



Simply attach templates, adjust for any pitch or offset and roll out your complete pattern. That's all there is to it.



Eliminates triangulation and radial lines, trimming, waste, large pattern stocks, and hours of time. You will save the entire cost of your JET PATTERN DEVELOPER in less than a week.

16 MM sound film available to groups

H. OWENS COMPANY

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Please send _____ Jet Pattern Developer(s) @ \$69.50 each.

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10 Day Money Back Guarantee—Please include state tax

Quality Since 1871

TURNER

**NO. 475
LOW-PRESSURE**

**TINNER'S
FIRE POT**



Smokeless . . . sparkless . . . sootless! Complete with Turner's exclusive "Carburetor Control" for more perfect combustion; positive flame control for exact heat desired. Construction assembly permits quick, easy accessibility and cleaning. Burner coil is extra-heavy seamless steel tubing; pump is heavy blow-proof brass. Fuel capacity—one gallon. Get details, too, on the Turner Plumber's Fire Pot; Turner's complete line of Blow Torches; the new Turner line of LP Fire Pots and Torches. See your jobber . . .

THE TURNER BRASS WORKS
SYCAMORE ILLINOIS
SINCE 1871

we hear that . . .

dising of "Winkler" equipment. First meeting will be at the Edgewater Beach Hotel, Chicago, January 8. The second is scheduled for the Somerset Motel, Boston, on January 12, and the third will be at the Bellevue-Stratford Hotel, Philadelphia, on January 14.

A MULTIPLE installation of 49 heat pumps has been completed by General Electric Co. at the Belmont Park Motel, Miami Beach, Fla.

The company exhibited its 1954 line of packaged commercial air conditioners at the recent All-Industry Refrigeration and Air Conditioning Exposition in Cleveland. On display were 3, 5, 7½, 10 and 15 ton models.

THE BILLINGS & SPENCER CO., Hartford, Conn., has purchased the majority of the common stock of the Peck, Stow & Wilcox Co. The board of directors of Peck, Stow & Wilcox resigned, with the exception of Mark J. Lacey, president, and Samuel G. Wilcox, executive vice president. The new directors are the present directors of Billings & Spencer, in addition to Mr. Lacey and Mr. Wilcox. Roland J. Ahern, president, Billings & Spencer Co., became chairman of the board.

THE A. F. DAVIS Welding Library, Ohio State University, has recently acquired over 2200 abstracts of British welding patents. This library was established in 1912

New COOK Blower Ventilators

Backwardly-inclined impeller, non-overloading

- ★ All-aluminum
- ★ Easy installation
- ★ Quiet impeller
- ★ Motor sealed from air stream
- ★ Automatic back-draft damper



WALL or KITCHEN EXHAUST — complete assembly is easily adjustable to wall thickness. In 7", 9" and 10" sizes. Model W.

ROOF VENTILATOR in 9", 10", 12" and 14" sizes. Single phase, 110 V. 2-speed; 220 V. 1-speed; or 3 phase, 1-speed, Model BV.

ROOF VENTILATOR in 7", 9" and 10" sizes. Base fits 6" and 8" pipe. Handsome interior grille with this and above model. Model R.

All models direct drive . . . damper optional.

COOK



Duct Fan



Exhaust Fan



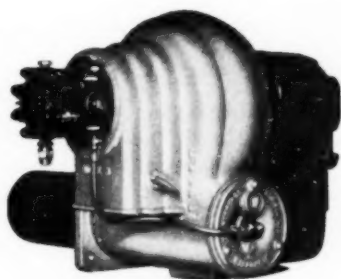
Man Cooler



Roof Ventilator

Write for Catalog BV, Dept. AA, Loren Cook Co., Berea, Ohio.

Wisconsin BURNERS

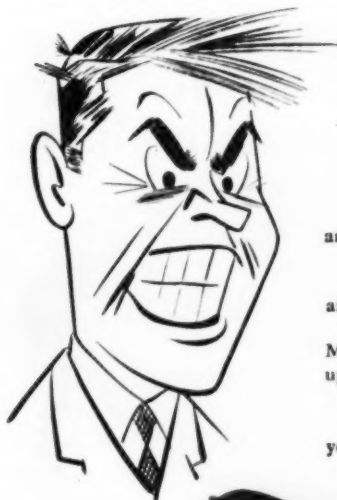


- A complete line — with Wisconsin Burners you can offer your customers a choice of 5 sizes — from $\frac{3}{4}$ G.P.H. to 18 G.P.H.
- Every Wisconsin Burner is factory tested under actual firing conditions.
- Wisconsin Burners have a reputation for quality that has made them a leader in the field.
- Available with the famous, efficient Shell Combustion Head.

FOR INFORMATION ON AVAILABLE TERRITORIES, WRITE

WISCONSIN OIL BURNER CO.

1134 REGENT STREET • MADISON, WISCONSIN

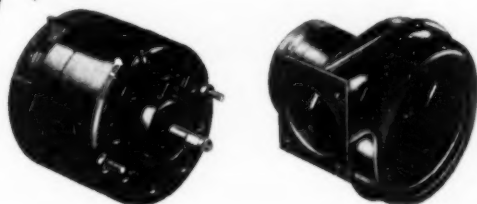


How to cool off a hot customer

Everything wears out in time, even with guarantees, still, service call-backs do tend to irritate certain customers. If nothing else, a service call is an inconvenience.

But there is a way to cool off that hot customer and bring back at least part of his smile . . . and that's by installing the best in replacement parts. For aging refrigeration, heating and air conditioning equipment suffering from worn out motors, we recommend REDMOND MICROMOTORS . . . a great line of motor units up to $\frac{1}{2}$ h.p. Also available is an equally fine line of blowers in capacities up to 280 cfm.

Drop us a line for the name of your nearest Redmond Distributor.



REDMOND DISTRIBUTORS, INC.
420 Lexington Ave., New York 17, N. Y.

REDMOND DISTRIBUTORS, INC.
420 Lexington Ave., Dept. A, New York 17, N. Y.

☐ Send data on MicroMotors
I am interested in _____ h.p. models.

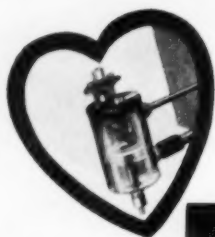
☐ Send data on Blowers.
I am interested in _____ cfm models.

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____



FLOTROL The Heart of the MONMOUTH HUMIDIFIER

Made of non-corroding bronze, stainless steel and plastic.



One outstanding feature of the Monmouth Humidifier that sets it apart from all others and makes it easy to sell is the time-tested FLOTROL water feed control. It is designed to operate for years without the nuisance of service. You can specify it with every assurance that it will give your customers trouble-free service and build your good will.

Write today for literature, prices and discounts on Monmouth Humidifiers — made in capacities up to 420,000 B.T.U. and employing fast-diffusion Monite plates. They can add an extra profit on every warm air job — new construction or replacement.

Cleveland Humidifier Co.
7802 Wade Park Avenue, Cleveland 3, Ohio

MONMOUTH HUMIDIFIERS

"Made-Rite" fittings Save job TIME!



One sure way to KEEP down job time is to check on assembly time for warm and cold air runs. If your figures prove it excessive, then it's time to check with us.

We can offer you a superior line of furnace fittings which will cut installation time to a minimum, and free your help for more jobs in less time.

We're equipped, too, for reolling, and slitting and shearing metals 14 gauge or lighter and up to 36" wide. Prices quoted on receipt of your specifications

"Made-Rite" Co., Inc.

Manufacturers & Suppliers
Furnaces — Pipe and Fittings
10th and Monroe St. Newport, Ky.

we hear that . . .

by A. F. Davis, vice president and secretary, The Lincoln Electric Co.

KENNETH J. BURNS, manager of sheet and strip sales for Inland Steel Co., has been granted a six months' leave of absence to serve with the National Production Authority in Washington, D. C. as deputy director and later as director of the iron and steel division. Benton J. Willner, assistant general manager of sales, will be in charge of the company's sheet and strip division during Mr. Burns' absence.

ARMSTRONG FURNACE SUPPLY, INC., has moved into its new building at Eight Mile and Telegraph Rds., Detroit, where it maintains a complete stock of furnaces and related warm air heating materials and supplies.

THE NEW CONSTRUCTION at the New York area steel service plant of Joseph T. Ryerson & Son, Inc., which will increase capacity about 50 per cent, is nearing completion. The addition consists of two large building units, 110 ft by 605 ft, and 85 ft by 580 ft. Total floor area of the enlarged steel service facilities is about 355,000 sq ft.

REVCOR has recently moved from Chicago to its new plant in Carpentersville, Ill.

Cut Installation Costs! One hammer blow permanently rivets



E-Z-ON Damper Controls are easily, quickly installed to save you time and money. E-Z-ONS lower initial cost offers you additional savings and extra profits. Start saving money now. . . . Call your jobber today!

LEADING JOBBERS STOCK "EZ-ONS"
In Canada — THERMIDAIRE CORP. LTD. Toronto

M. A. GERETT CORP.

724 WEST WINNEBAGO STREET, MILWAUKEE 5, WISCONSIN

preferred by thousands

The Thermo-Base system of baseboard warm air heating is preferred by thousands of architects, contractors and heating engineers.

Sound design, careful engineering and quality materials are fast making Thermo-Base America's favorite. Cash in on this popularity by quoting Thermo-Base on every job.

Thermo-Base

**WARM AIR
BASEBOARD
HEATING**

GENTLE WARMTH FROM CEILING TO FLOOR

Installed around the outside walls, Thermo-Base Units eliminate drafts, hot spots and frigid fringes — giving equal distribution of humidified and filtered air.

FREEDOM FOR FURNITURE ARRANGING

Thermo-Base gives every inch of space the same "gentle warmth" . . . there are no blasts of heat or uncomfortable cold drafts to interfere with the arrangement of furniture. Draperies and walls stay clean longer.

IDEAL FOR AIR CONDITIONING

The gentle distribution of cool air through Thermo-Base makes it the perfect system for summer cooling.

THE
LEADING JOBBERS
IN YOUR TERRITORY
WILL BE HAPPY TO
PROVIDE COMPLETE
DETAILS — OR
WRITE TO

Thermo-Base Division, Gerwin Industries, Inc., Michigan City, Indiana

**Look for this trade mark
on every elbow and shoe**

TRADE *F. Dieckmann* MARK

Established 1871

All angles from 10 through 90 degrees
—All Sizes—All Styles—All Standard
Roofing Metals. Hot-dipped galva-
nized after formation. Jobbers like to sell them because Roofers prefer to
install them.



WRITE FOR COMPLETE CATALOG

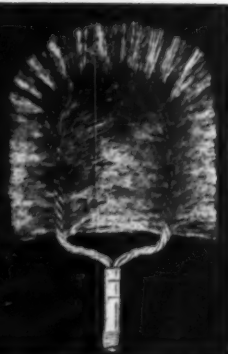
THE FERDINAND DIECKMANN COMPANY

1300 HARRISON AVENUE

CINCINNATI 22, OHIO

SCHAEFER

**BOILER
BRUSHES**
clean better,
last longer



SCHAEFER DOUBLE STEM HORSE SHOE STYLE

One of many Schaefer Furnace Brush Designs, the Double Stem Brush promises a long lifetime of cleaning efficiency. Special "Silver Brite" Rustproof Wire withstands moisture, steam, cellar dampness, stays bright and stiff many times longer than ordinary brushes. Available in several sizes. Write for special prices and complete Schaefer Flue and Furnace Brush Catalog No. 650.

LOOK for the trademark

SCHAEFER BRUSH MFG. CO.
117 W. WALKER STREET • MILWAUKEE 4, WIS.

SCHAEFER BRUSHES
—MILWAUKEE—

**BUY SCHAEFER
...IT'S SAFER**

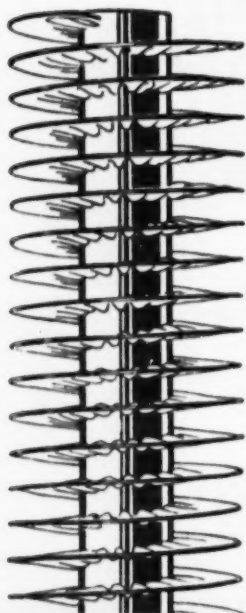
AEROFIN

FIN-TYPE COILS
For
Fast, Efficient

**HEATING
and
COOLING**

*Write for
Information*

**AEROFIN
CORPORATION**
S. Geddes St. Syracuse 4, N.Y.



we hear that . . .

SID HARVEY stores will be opened this fall in Providence, R.I., Hartford, Conn., Allentown, Pa., and Brooklyn, N.Y.

GENERAL FILTERS, INC., has moved into its new plant at Novi, Mich., a suburb of Detroit.

MITCHELL MFG. Co. recently conducted a contest for the best window displays built around its room air conditioners. The winning entry was submitted by Paul H. Rose Corp., Norfolk, Va.

CARRIER CORP. plans a \$10,000,000 expansion program involving the construction of a new plant in the South and additions to present facilities in Syracuse. The new plant will be devoted to the manufacture of room air conditioners, year 'round residential air conditioning equipment, and self-contained units for small commercial establishments. The addition to the Syracuse facilities will include office, laboratory, warehouse and storage space.

First of 20 houses featuring Carrier year 'round air conditioning in a development at Westport, Conn., was recently opened for display. The houses are of split level design, are all in the \$27,000 class.

Save Time... Labor... Material
with **BEVERLY**
metal cutting
SHEARS

**throatless
SHEARS**

Make any cut—straight, irregular, curved. Exclusive design permits turning work any direction while cutting. 4 models—cap. to 3/16".



Inside SLOTTER

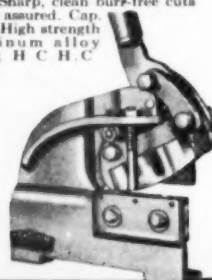
Makes cuts up to 8" inside edge of sheet. Sharp, clean burr-free cuts always assured. Cap. 16 ga. High strength aluminum alloy body; H C H C blades.



slitting SHEAR

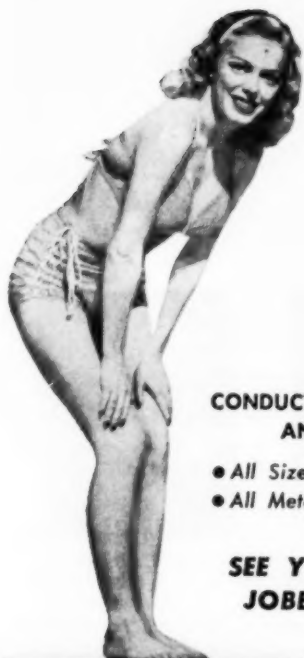
New "SS" Series—easier cutting with compounded linkage. 3 models—cap. to 1/4"; trimming capacity to 1/4" mild.

See your Beverly Distributor. Write for FREE illustrated Bulletin.



Beverly SHEAR MFG. CO.

3020 W. 111th STREET • CHICAGO 43, ILLINOIS



OUR ELBOWS HAVE PERFECT FORM

CONDUCTOR PIPE ELBOWS AND SHOES

- All Sizes • All Angles
- All Metals • All Gauges

SEE YOUR
JOBBER



**The CINCINNATI
ELBOW CO.**

2021 EASTERN AVE.
CINCINNATI 2, OHIO



Steel PRESS BRAKES

Many Standard Sizes
Latest Designs
and Features
for Fast Accurate Work.

Complete line of
induction hardened
forming dies for all
makes of press brakes.



All sizes of CHICAGO press brakes are readily
adapted for a wide variety of bending, forming, draw-
ing, notching, blanking, punching, embossing, etc.

Full Particulars and Recommendations for Any Job upon Request

DREIS & KRUMP
MANUFACTURING COMPANY

7404 S. Loomis Blvd., Chicago 36, Illinois



INSUL-LYTE COMBUSTION CHAMBERS

Low cost!
Light weight!
Easily installed!
Maximum efficiency!



Yes, INSUL-LYTE pre-cast combustion chambers are rapidly becoming the choice of leading manufacturers, wholesalers and contractors. With good reason, too! They weigh 40% less than other pre-cast types. Their porous structure absorbs sound, assures quiet oil burner operation. Engineered for maximum efficiency, they attain high surface temperatures in seconds, eliminating carbon deposits and fuel waste. They're quickly and easily installed without using tools or cement. And they actually cost less than any other pre-cast make! Get all the facts today!

Send for this new FREE catalog

It describes the new, specially formulated material INSUL-LYTE, gives you pictures and complete specifications of our standard model chambers, illustrates "specials" we have manufactured. Send for it now!

Some good territories still open for manufacturers' representatives. Write, wire or phone us for details.

INSULATING CASTABLE CORP.

132 WEST PLEASANT AVE. • RIVER ROUGE 18, MICHIGAN

NO. T-12

Weight — 12 ounces
Weight Dozen —
17 pounds

Tinner's
Riveting
Hammer



Tinner's
Setting
Hammer

NO. T-18

Weight —
18 ounces
Weight dozen —
21 pounds



These hammers are used by workmen everywhere because their weight and balance make jobs easier.

Whitney hammers are accepted because of perfect balance, the leather grip which CAN'T loosen, and because the sheet metal edge cannot damage the handle neck. They also have one-piece heads and handles that prevent breakage and splintering.

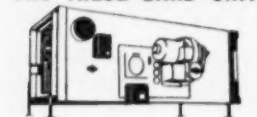
Please write us for literature. Carried in stock by all leading jobbers.



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636 RACE ST. ROCKFORD, ILL.

BARD MULTI RADIATOR WARM AIR HEATING

TRY THESE BARD UNITS ON YOUR NEXT JOBS



85,000 BTU OIL-FIRED
For attic, ceiling suspension or
crawl-space. Low cost.



**70,000 BTU
GAS HI-BOY**

Perimeter or utility
system for conven-
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flow installations.
Low cost.

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Top performance.



**ALL TYPES
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Known everywhere
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watch for our 1954
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field

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- World's most widely used Barometric Draft Controls.
- The controls preferred by manufacturers, jobbers and dealers.
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FIELD CONTROL DIVISION
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AFFILIATES
CONCO BUILDING PRODUCTS, INC. • Brick, Tile, Stone
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appointments . . .

W. H. OLSEN as assistant to the president of the C. A. Olsen Mfg. Co. Mr. Olsen is also assistant to the president of the Henry Furnace Co. Previously he was sales representative and consultant for "Luxaire" and "Moncrief" equipment in Michigan and Indiana.



W. H. Olsen



J. H. Holton

JOHN H. HOLTON as vice president and general manager in charge of the newly formed Unitary Equipment Div., Carrier Corp. This new division will handle reciprocating compressors, room air conditioners, and year 'round residential units. Mr. Holton has been with the company for 23 years. Until recently he was in charge of the Allied Products Div. Assistant general manager of the

FLANGES THE DUCT

IN LESS THAN
5 SECONDS

Works like a bar-
folder with a new
twist.

Handling the
work back and
forth has been
eliminated by a
unique manipula-
tion of the bender
itself.

"Best
little tool
in the shop"



No money tied up in idle equipment . . . And no time wasted in making adjustments . . . Fits any size ducts up to width of bender and any thickness up to 20 gauge mild steel.

No. 12 SMITH'S CLEAT BENDERS (12" Wide) —————\$46.20*
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*Prices subject to change without notice)
FOB Waukegan, Illinois

R. E. SMITH

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WAUKEGAN, ILL.

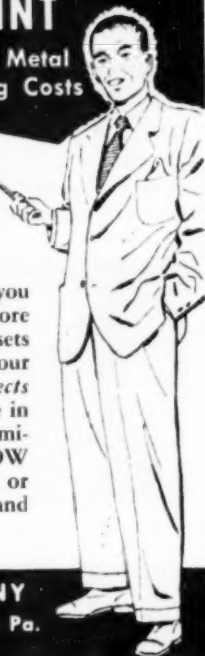
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Yes, 370 Special can save you money. Users report it covers more than five squares per gallon . . . sets up in 4 or 5 hours. It pleases your customers because it *really* protects against corrosion. Also available in green, blue, gray, brown and aluminum. ORDER 370 SPECIAL NOW FROM YOUR DISTRIBUTOR, or write for complete details and prices.

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Established 1847



*I give my customers
the BEST!*

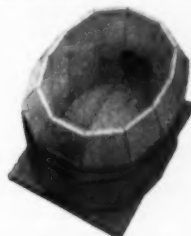
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STANDARD ROUND TYPE
for Boilers
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Sizes up to 2.0 GPH



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Specially Designed for
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(Can be used on any job where
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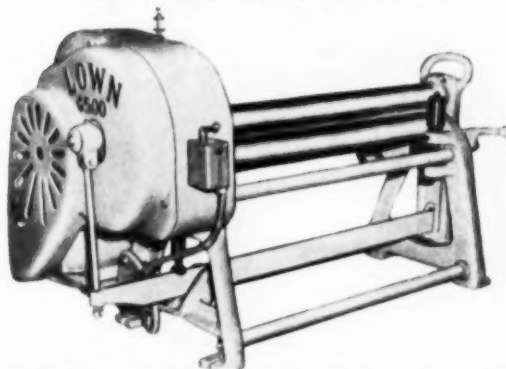


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Sizes up to 5.0 GPH
Write for new complete
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Oil Heating Supplies Division, Manufacturers, Lynn, Mass.

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Model G-500
featuring Cone Rolling Attachment



Model G-550 Lown Slip Roll Former with 5" x 50" rolls, all power driven

A new improved modern design, engineered for durability, strength and service.

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- Fast, sturdy, easy to operate. Prompt Deliveries.
- Other machines with 2" to 9" dia. rolls also available.

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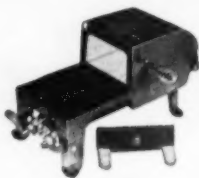
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1800°F. without forced air blast.

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The most efficient, powerful and economical bench furnace made for heating soldering coppers up to 12 lbs. per pair. Also used for heat treating, case hardening, and annealing carbon steels. Two burners. Firebox $3\frac{3}{4} \times 4\frac{1}{2} \times 5\frac{1}{2}$. Complete with work rest block and baffle plate. \$20.80 F.O.B. factory.



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For heating largest soldering coppers, stenciling irons, branding irons, etc.; heat treating carbon steels, and soft metal melting. Lid on hood is removable for inserting 22 lb. pot for melting lead, tin, babbitt, etc. Three burners. Firebox $6\frac{1}{4} \times 5 \times 6\frac{1}{2}$. Complete with pot \$38.50 F.O.B. factory.

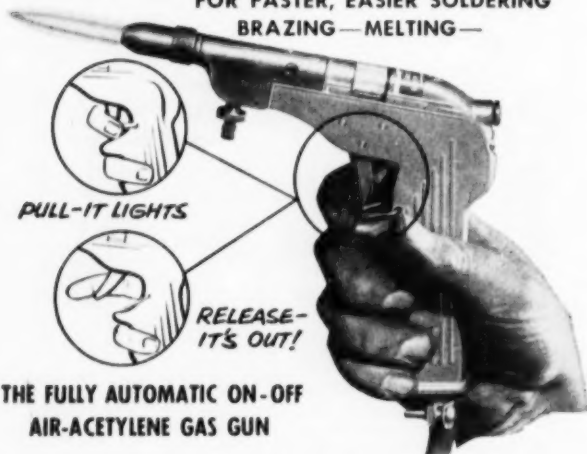


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THE FULLY AUTOMATIC ON-OFF AIR-ACETYLENE GAS GUN

Instant, one-hand operation saves time, gas, and eliminates open flame hazards when not in use. Just pull the trigger and the air-acetylene gas lights instantly, release and it's out! As simple as all that, and no "time-out" to light up and adjust. The Torch-o-matic gas gun pays for itself many times

over in savings and convenience. Three sizes of tubes and nozzles to take care of any job. Will fit your present equipment. Halide Leak Detector attachment locates the slightest refrigerant gas leak. Write for the details on how Torch-o-matic can speed your operations and cut down costs.

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appointments . . .

new division will be Russell H. Gray, and the marketing functions will be directed by John M. Bickel, vice president.

BURTON L. WOLFF as president of the National Association of Aluminum Distributors. Mr. Wolff is head of Benjamin Wolff & Co. Other officers named by the group are: vice presidents, Wayne Rising, Ducommun Metals & Supply Co. and John J. Hill III, Hill, Chase & Co.; and treasurer, Marvin B. Marsh, Marsh Steel Corp.



B. L. Wolff



W. J. Thurston

WILLIAM J. THURSTON as factory sales engineer for the Delavan Mfg. Co., covering New York State, New Jersey, eastern Pennsylvania, Maryland and Delaware.

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FAST . . .

EASY . . .

With



MELAWAY COUPLINGS

Adjustable for 4-5-6" half round gutter.

Will align gutter and square miters. Gutters may be joined at the eave as easily as on the ground.

Prevents expansion damage to gutter. The only satisfactory method for repairing gutter. Applicator guaranteed.

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Whatever roof ventilation installation problem you face, you can rely on Allen-engineered, High-Efficiency Roof Fans for the solution. These motor-driven fans are ruggedly designed to do a steady, heavy-duty job, removing air laden with heat, fumes, vapor, dust. Installation is rapid, easy. To install, merely cut opening in roof, flash housing to roofing material, and connect electrically. Designed for flat roof or level curb installations. Available in wide range of capacities (750 to 45,000 cfm), many sizes, and in Standard, Direct Drive, and Remote Drive types. Write for catalog on complete line of roof ventilators

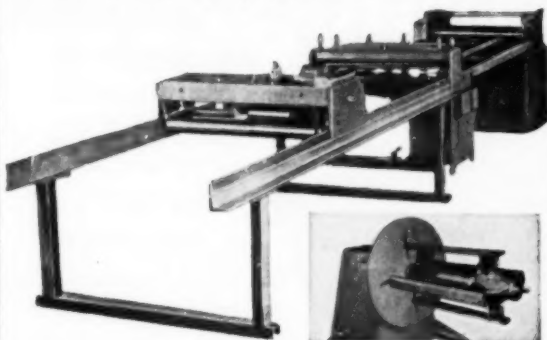
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Modern De-Coiling Equipment by "DAHLSTROM"



Coiled materials are fed, straightened, measured, cut into sheets, and ejected on a continuous basis automatically. Line shown handles to 36" widths in 20 ga. mild steel—coil weights to 6000#. OTHER CAPACITIES AVAILABLE.

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- Tons more storage in the same space

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CAN COUNT ON

CLIPPER VENTILATORS

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SPACE SAVER...and a Labor Saver

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Because it's a
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- In All Sizes
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SALES ARE ZOOMING!

BABY-SAFE
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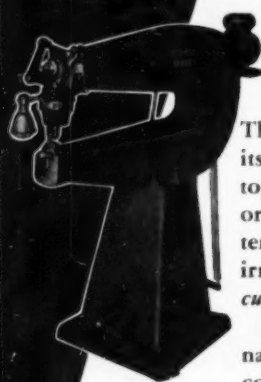
appointments . . .

SID HARVEY, INC. as factory rebuilding station for the Williams Div., Eureka Williams Corp. All of the Sid Harvey stores will stock the company's line of rebuilt hydraulic oil valves, motors, transformers, pumps, controls, etc., for immediate exchange so that dealers may replace defective parts without waiting for the rebuilding to be done.

Victor E. Reed is field sales representative in the Boston metropolitan area for the division. His territory includes Rhode Island, part of Massachusetts and part of Connecticut.

HARRY F. HALDEMAN, INC., Los Angeles, as air conditioning distributor in the southern California area for Servel, Inc. Other air conditioning distributors recently appointed are: Cleveland Air Conditioning Corp., 2300 Payne Ave., Cleveland, to cover north central Ohio; Refrigeration Engineering Co., 2120 2nd Ave., Seattle, to handle a number of counties in Washington; and Temp-Control Corp., 2905 N. Mississippi Ave., Portland, Ore., to cover the state of Oregon and five Washington counties.

CLYDE FREDERICKS as factory representative covering the St. Louis area for Morrison Steel Products, Inc. H. Forrest Oakes will cover the Chicago area; Joseph W. Myers, western Ohio and northern Kentucky; and Oscar



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- **SAVES Manpower**

CIRCLE CUTTING ATTACHMENT Included as STANDARD EQUIPMENT with this Machine

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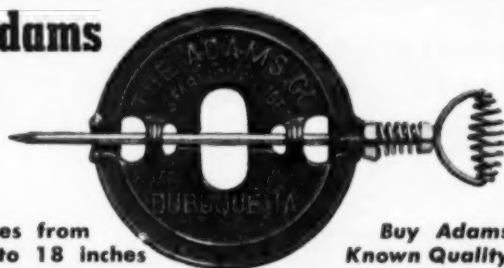


Made in 3 and 4 Ft. lengths,
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Brakes may be purchased with or
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They incorporate all the quality
and ruggedness of our larger
Brakes, plus the combination
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Known Quality

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Quickly enlarges or reduces size of head for slip-
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In the erection of pipe and gutter no other tool
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Especially adapted for crimping conductor pipe
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PLUS CONTROLLED DOMESTIC HOT WATER SUPPLY**



for smaller homes



for larger residences also provides
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appointments . . .

W. Berg, western New York, northwestern Pennsylvania and eastern Ohio.

RAY B. SMITH as sales representative for the Wilder Mfg. Co., Inc.

A. C. CLASEN as district manager of the new branch of Milwaukee Electric Tool Corp. located at 2508 W. Chicago Ave., Chicago 22. He will be assisted by L. T. Morand, Jr., sales representative, and L. Korcz, repair service manager.

EDWARD E. BANGS as executive assistant working on the development of distribution and sales of winter air conditioners and conversion burners in the New England territory for the gas heating division of York-Shipley, Inc.

ROBERT M. GORDON as sales manager for the Air Impeller Div., Torrington Mfg. Co. Mr. Gordon joined the company last February as assistant sales manager of the division.

JAMES E. WALDRON as sales manager of Cronstrom Heating & Sheet Metal, Inc.

Statement of Ownership and Management of

AMERICAN ARTISAN

for October 1, 1953

The following is a statement of ownership, management, etc., as required by the act of Congress of August 24, 1912, as amended by the acts of March 3, 1933 and July 2, 1946 (Title 39, United States Code, Section 233) of American Artisan, published monthly at Chicago, Ill., for October 1, 1953.

1. The names and addresses of the publisher, editor, managing editor, and business manager are:

Publisher, F. P. Keeney, Chicago, Illinois.

Editorial Director, C. M. Burnam, Jr., Chicago, Illinois.

Editor, C. M. Barnes, Chicago, Illinois.

Business Manager, Chas. E. Price, Glencoe, Illinois.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.)

Keeney Publishing Company, 6 North Michigan Avenue, Chicago 2, Illinois. Stockholders: F. P. Keeney, Chicago, Illinois; W. J. Osborn, Fairfield, Connecticut; Chas. E. Price, Glencoe, Illinois; Robert A. Jack, Cleveland Heights, Ohio.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

F. P. Keeney, Publisher

Sworn to and subscribed before me this 14th day of September, 1953.

Grace E. Waymire.

[My commission expires February 10, 1954]

(SEAL)

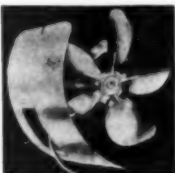
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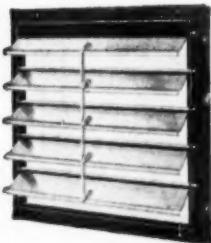
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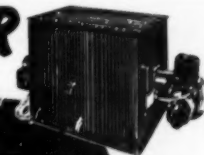
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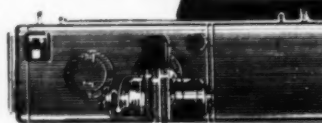
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WANTED — Salesmen now calling on Heating and Air Conditioning contractors and doing promotion work with Engineers, Architects and Builders, to sell BRANDES famous line of Domestic, Commercial and Industrial RADIANT FORCED AIR BASEBOARD for both heating and air conditioning. Never has a product gained popularity so fast or solved so many heating and cooling problems. It will pay you well to handle this profitable, easy to sell line of perimeter baseboard. Good midwest territories are still open. Let's discuss it. Contact: DEL. WELLCOME ENGINEERING CO., 7444 W. Carmen Ave., Chicago 31, Ill. Phone UNDERhill 7-8119.

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A. KORYTA, INC.

255 THE ARCADE CLEVELAND, OHIO

FOR SALE — Sheet metal and warm air heating shop in central Illinois town established 29 years. 2 trucks, tools, stock and good will. Address Key 952, American Artisan, 6 North Michigan Ave., Chicago 2, Ill.

FOR SALE — Small Manufacturing business. Manufacturing both black and galvanized baskets from 6" to 14" deep. Also ½ and 1 bushel baskets. Over 800 customers including larger rubber and ball bearing firms, grain elevators, flour mills, etc. Owner has passed away. Write Mrs. Evelyn Long, c/o Seneca Mfg. and Sales Co., 303 North Washington St., Tiffin, Ohio.

wanted . . .

WANTED — Chief Engineer, experienced in design and development of fan and blower equipment. We are one of the well established and leading manufacturers in the industry and our employees know this advertisement is appearing. Excellent opportunity. We are located in the midwest. State experience and qualifications. Reply to Key 949, American Artisan, 6 No. Michigan Ave., Chicago 2, Ill.

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. . . are you looking around
for items or personnel
to make your organization more
efficient? A simple classified
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in American Artisan
will turn the trick
for you quickly and
at low cost.

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COMPLETE LINE OF SHEET METAL & VENTILATING SUPPLIES

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6 N. Michigan Ave., Chicago 2, Ill.

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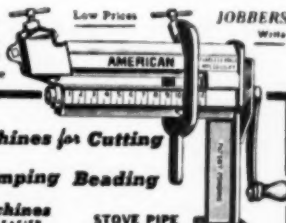
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- Increases Production
- Prevents Injury
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Machines
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gauge mild steel and

heavier aluminum and

copper. Can be bolted to

bench or truck or on included,

32" high floor stand. All steel

construction. Shipped Express or Freight collect.

30" size, 95 lbs., \$35.50. 36", 105 lbs., \$40.00. 48"

135 lbs., \$55.00. 15" VYKE BRAKE, 16 gauge capacity, \$21.50.

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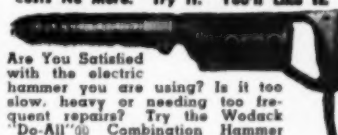


30, 36, 48"

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A Better Electric Hammer
Costs No More. Try It. You'll Like It.



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Fastest and most accurate on the market. Two sizes for circles up to 36" and 48". Guaranteed. Order now.

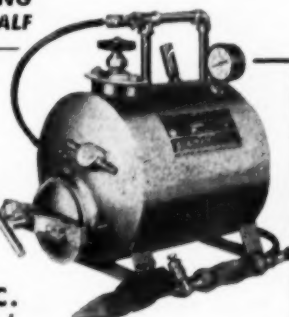
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Post Office Box 5035

Newark 5, N. J.

CUT SOLDERING COSTS IN HALF

Will give you hot soldering iron in one minute—Solders eight hours for 10¢—Right amount of heat—No changing of irons—Make your own fuel from water and carbide.



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SECURITY
BONDS
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Wolff Metal Service



**your stand-by aluminum stockroom
where you "buy" to save**

One place you may be able to save far more than you realize is in the cost of aluminum for fabrication. Quite frequently different grades of aluminum will serve your purpose. Then why use a higher priced stock just because you have it, when less expensive metal will do as well.

It is just for this reason that Wolff has on hand a balanced stock of aluminum in gauges, sizes, types and shapes to fill in

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Fillmore 4-7200

Chicago
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BENJAMIN WOLFF COMPANY

General Office and Warehouse — 1945 N. Cornell Ave., Melrose Park, Ill.
Wisconsin Office — 176 West Wisconsin Ave., Milwaukee 3, Wis.

SOME ANSWERS TO YOUR SHOP QUESTIONS ON

welding straight-chromium Stainless Steels

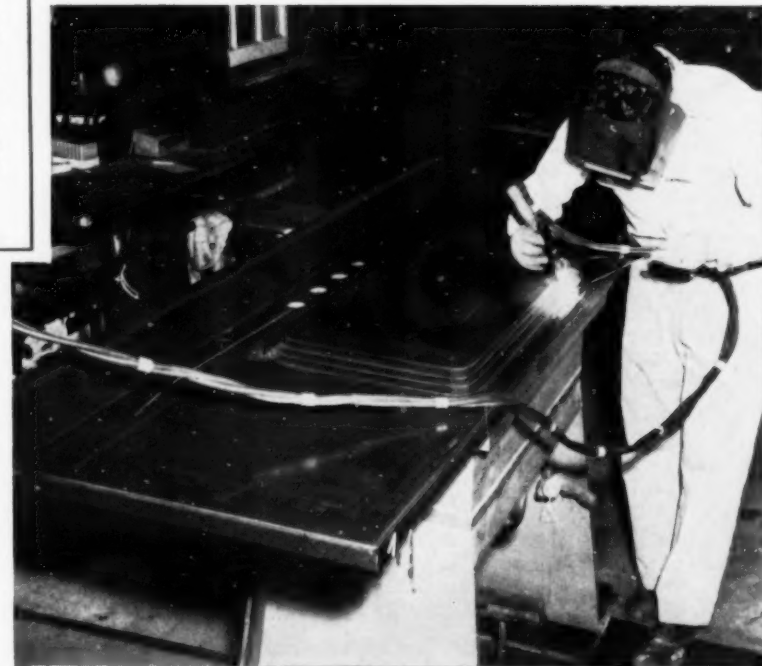
This is another in a series of advertisements discussing the straight-chromium grades of Stainless Steel from the standpoint of fabricating performance. Other operations that will be considered in future discussions are machining, cutting, spinning and finishing.

MOST of the common commercial methods of welding can and are being applied successfully in the fabrication of straight-chromium grades of Stainless Steel. Methods being used include torch, arc, spot and resistance welding.

Welding temperatures should be kept as low as possible, since straight-chromium grades have a tendency toward grain growth which heat-treatment may not correct. It has been found that, in heavy sections, numerous small beads followed by annealing often gives the best results.

Tendency toward warping and movement in welding is minimized by the low coefficient of expansion of Type 430 straight-chromium Stainless Steel.

Wherever feasible, it is recommended that the welding rods you



Welding Type 430 bowls to Type 430 sink tops

Geneva Modern Kitchens, Geneva, Ill., is using Type 430 Stainless Steel in its line of kitchen sinks. Here a drawn sink bowl is being welded to the sink top by the electric arc method. After welding, the tops are finished by grinding.

use be of nickel-bearing grades of Stainless Steel. But where color match is important, welding rods of a straight-chromium grade can be used successfully, especially when the weld is to be annealed.

Our representatives can help you with welding problems that you may encounter in using U·S·S 17 (Type 430) and other straight-chromium grades of Stainless Steel. This help is yours for the asking.

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NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS

3-1010

UNITED STATES STEEL

